OODY—Last Word in Combat Models • Fokker E-3 Scale

MODEL AIRPLANE NEWS

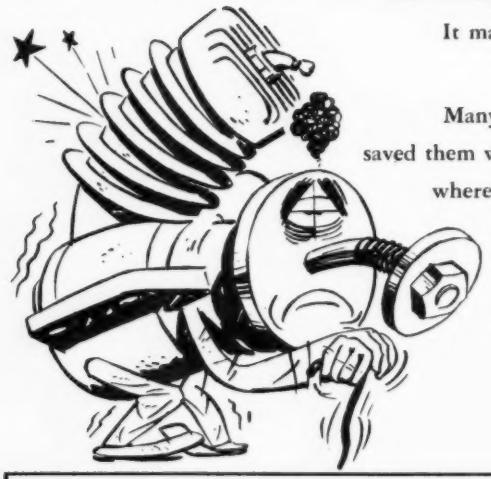
JUNE 1958—35 CENTS

Curtiss "Akron" Fighter

Is your motor OLD and TIRED?

It may be just the fuel you are using. Don't throw your motor away until you have tried a can of Fox SUPERFUEL.

Many modelers who have thought their motors were worn out, have saved them with Fox SUPERFUEL. Its extra thick oil film holds compression where others have failed. Result: Many more pleasant hours of flying.



CHAMPION FUEL HALL OF FAME

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Stunt Open

R. C. ALLEN
Radio Control (Rudder)

HARDY G. LEWIS, JR.
Junior National Champion

JOSEPH W. KASTETTER
Control Line Combat — Open

GUARANTEE

We will replace any motor which has been damaged by Fox SUPERFUEL. Read the formula on the can. It's one of the best. Each can is guaranteed to be true to formula.

Champion Products — Fort Smith, Arkansas

PINTS, **90¢** AT YOUR DEALER

A MOTOR IS NOT WORN OUT UNTIL IT WON'T RUN ON FOX SUPERFUEL!

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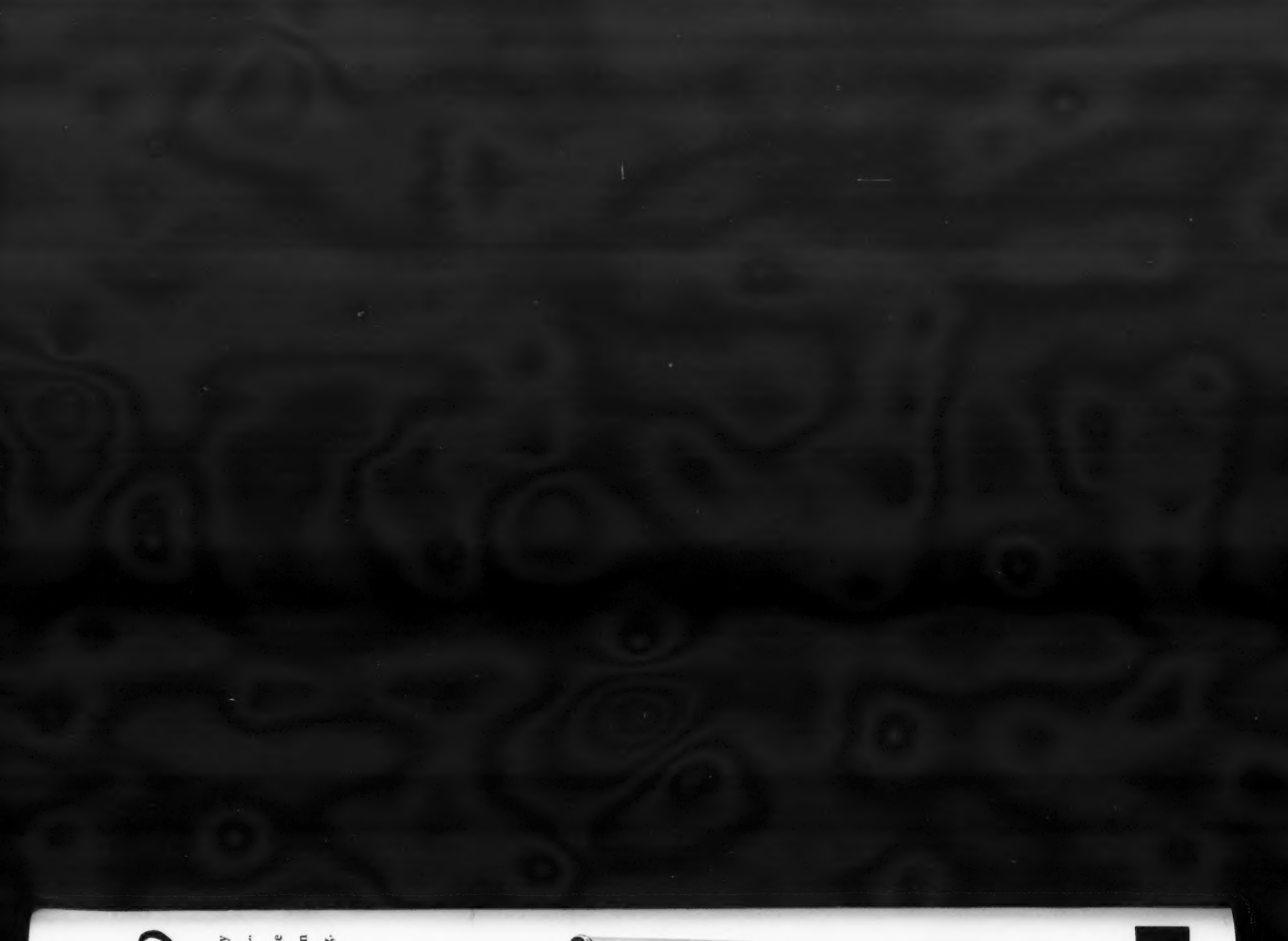
FORT SMITH, ARKANSAS



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For the *Supersonic Era*

Need No Building!

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PLM-30 **$7.95**

Handle and control lines included

READY-TO-FLY TRUE-TO-SCALE U-CONTROL GAS MODEL COMPLETE WITH 1958 model easy-starting "OK" Cub .049A Engine, with twist cord starter. Faithful replica of popular sports and executive plane in vivid two-tone plastic; cushion rubber tires; tricycle landing gear. No building necessary. Colorful "safety-storage" container. Control-model flying at its best—yet so low-priced! Wingspan 16", length 11⅜", weight 6 oz.

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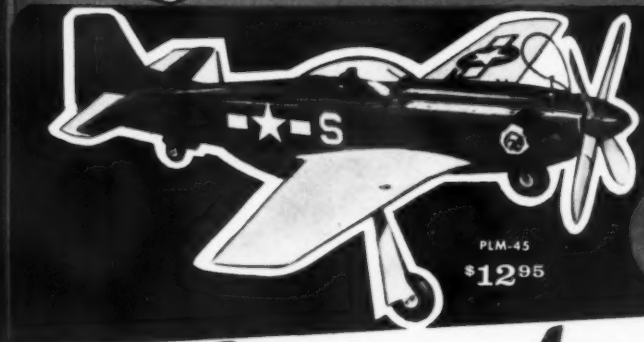
The *Mustang F-51*

TRUE-TO-SCALE



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The *Sabre 44*

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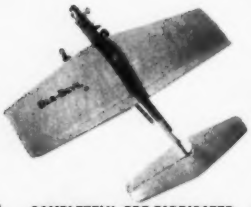
Send for these 2 BIG COMET BOOKS:

The New 1958 Comet Catalog—**20c**; shows hundreds of models in color. 20-Page Book—"What Makes An Airplane Fly"—lots of pictures and diagrams—printed in 2 colors—**25c**.



new DAR-DEVIL JUNIOR

Beginner or expert, you get precision performance in stunt and combat flying with this **$7.95**

"DAREDEVIL OF THE FLYING CIRCLE!"

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Pee-Wee to King Size

.14 oz. to 5.1 oz. capacity. .....50c-75c-$1

REDWING SENIOR **$9.95**

Completely built. Just mount the engine (.19-.36), fuel tank and dope. Wing span 37½"; length 24".

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Includes all hardware and pre-shaped parts. Wing span 30"; length 20". (For .09-.19 engines.)

DAR-WING Kit **$4.95**

Wing span 46"; length 18¾". (For .19-.36 engines.)

DAR-WING JUNIOR Kit **$4.50**

Wing span 36"; length 16½". (For .15-.29 engines.)

The Quality Line PLASTIC TUBING

All clear. **STAYS SOFTER LONGER** with any type of hot fuel.

Small, 10c ft.; Medium, 15c ft.; Large, 20c ft.

DAR-FLEX CONTROL-LINE WIRE

Two equal lengths of NON-KINKED stranded stainless steel flexible wire. Wound on permanent aluminum reel. Each length precision cut to 57'6" to allow for length of handle and model lead-out lines. Makes up to an accurate 60'. Eyelets attached. Eliminates all field cutting.
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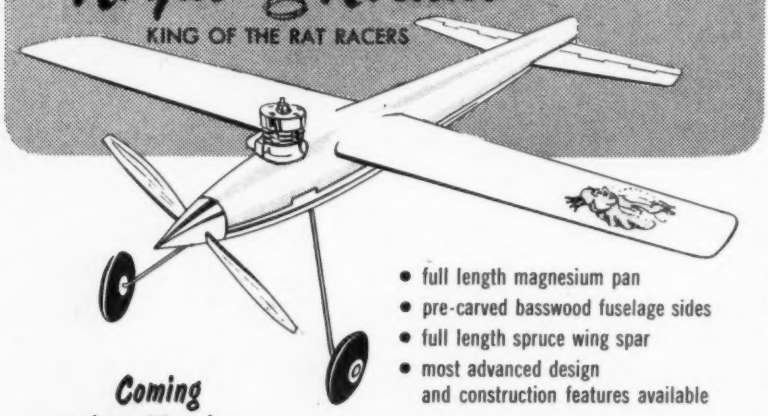
Royal Rodent®

KING OF THE RAT RACERS



- full length magnesium pan
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20" Magnesium Proto-Speed Team or Rat Racing Pan $3.95

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Contest Calendar

Enter or visit these meets.

AMA SANCTIONED CONTESTS

Model meet goers and organizers alike benefit from the contest coordinating program which is connected with AMA meet sanction. The goal is to prevent two like meets from falling on the same date if they are located nearby. Write to AMA Headquarters, 1025 Connecticut Ave., Washington 6, D.C., for details of meet sanction procedure. This magazine cannot co-ordinate or list announcements not made through AMA.

MAY

3-4—*Glenside, Pa.* (A) Glenside Air Scout Club R/C Forum. Richard Norman, Contest Director, 2319 Geneva Ave., Glenside, Pa.

3-4—*Hammond, La.* Second Annual Ravin Cajuns' Free Flight Contest for FFG, OHLG, TLG, OR, and RC. L. S. Maddry, C.D., 1906 Wilton Drive, New Orleans, La. Pending.

4—*Delaware, O.* Pending.

10-11—*Anderson, S.C.* (AAA) Second Annual Armed Forces Model Plane Contest for FFG, RC, OHLG, TLG, CLFS, CLC, non-flying scale, CLS, TR, CL, and RR. Carl E. Trego, C.D., Box 726, Shaw AFB, S.C.

11—*Dallas, Tex.* (AA) Cliff Model Club 1958 Contest No. 1 for FFG, OHLG, and rocket. William T. White, C.D., 2930 Kingston, Dallas, Tex.

11—*Hazardville, Conn.* (AA) Springfield Sky Hawks' Annual Meet for CLS, CLC, and CLFS. George F. Jordan, C.D., Shaker Pines Lake, Hazardville, Conn.

11—*Jersey City, N.J.* (AA) State Championship for Combat. George Meliado, C.D., 855 Broad Ave., Ridgefield, N.J.

11—*Reading, Pa.* (RT) Reading Aeromodelers' Record Trials for control line classes. Gerald A. Flamm, C.D., 654 North 6th St., Reading, Pa.

11—*E. St. Louis, Ill.* (AA) Parks College Cloud Hounds Meet for CLC, RR, FFG, CC, RC, PL, OHLG, and TLG. Peter W. Soule, C.D., 825 Robinwood Dr., Florissant, Mo.

11—*El Paso, Tex.* (RT) Record Trials for free flight classes. Capt. Richard Moorhead, C.D., 4916 Wichita Dr., El Paso, Tex.

17-18—*Austin, Tex.* Pending.

18—*Chicago, Ill.* (RT) Chicago Prop Nutz Record Trials for all free flight classes. Peter J. Sotich, C.D., 3851 W. 62nd Pl., Chicago 29, Ill.

18—*Springfield, O.* Pending.

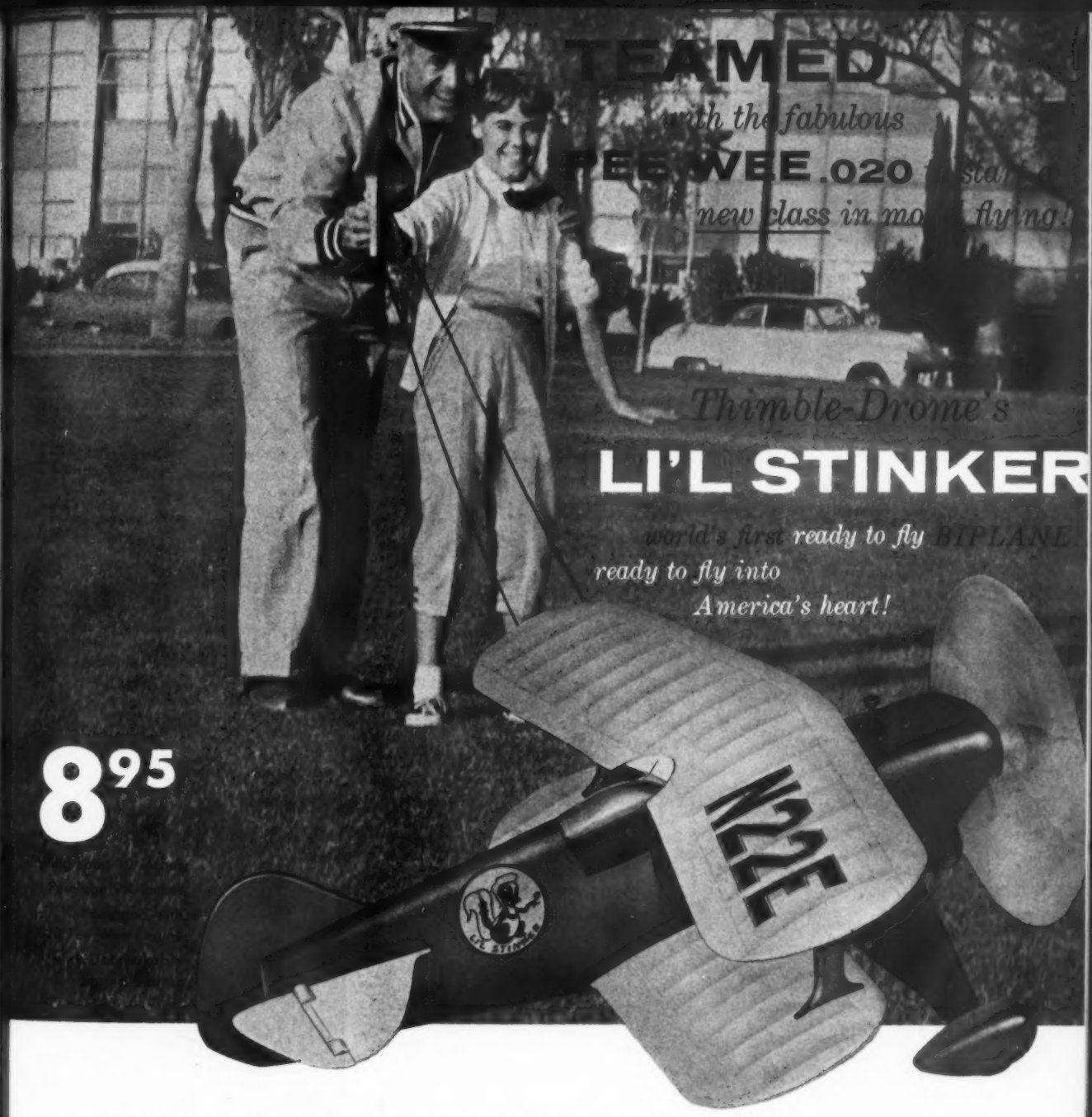
18—*Somerville, N.J.* (A) Greater New York Inter-Club Meet for FFG and OR. Restricted to members of Greater N.Y. Inter-Club Group. Sal Cannizzo, C.D., 293 Maryland Ave., Staten Island 5, N.Y.

18—*Monroe, Mich.* (AA) A.R.C.S. Second Annual R/C Meet. Robert G. Boomer, C.D., 17350 Brody, Allen Park, Mich.

18—*Smyrna, Tenn.* (AA) Seventh Annual Southern Model Airplane Championship Meet for RR, CLFS, CLS, CLC, proto speed, OHLG, and RC. Harry Carden, C.D., 2906 W. Linden, Nashville, Tenn. Pending.

18—*Glen Burnie, Md.* (AA) Balsa Butcher Combat Contest for CLC and clobber. F. G. Stroh III, C.D., Delaware Ave. & Drum Point Rd., N. E., Glen Burnie, Md.

(*Continued on page* 59)



Here's the most exciting power model ever built! A BIPLANE designed expressly for the amazing Thimble-Drome PEE WEE .020 engine that has taken the country by storm—LI'L STINKER is authentically modelled in high impact plastic from the famous Pitts Special. Its jewel-like authenticity—from wing struts to landing gear skirts—will excite everyone who *sees* it! And its superb Thimble-Drome flyability will THRILL everyone who *flies* it! Just as use of *micro* wave lengths opened unlimited potentials in radio transmission . . . this *brand new* "half ½A" team will bring new thrills, NEW EXCITEMENT to model flying! Your favorite dealer has this new "team" waiting for you at his shop now!

YOU KNOW
YOU'VE GOT THE BEST,
WHEN IT'S BY
THIMBLE-DROME

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29th Year of Publication

MODEL AIRPLANE NEWS

M.A.N.

JAY P. CLEVELAND, President and Publisher

JUNE 1958 Vol. LVIII, No. 6

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by William Winter

► Jim Walker is gone. Jim went suddenly, with his boots on, so to speak, the way he would have wanted it. Only the day before, March 11, he had delighted the crowd at the California Hobby Show with his Ceiling Walkers, hand-tossed gliders and Firebees. As Johnny Brodbeck said afterwards, "Jim lived for model airplanes, with an enthusiasm that was unequaled by anyone and, in my opinion, died for it."

Walker was a modeler. A model flier without peer. A manufacturer. Showman. He invented. Subject of a thousand stories, he was always ready with a gem of his own. Whatever you were in this hobby he was, too. When he turned on the steam he was in a class by himself, on the go, driving, suggesting, criticizing, never relaxed but, good gravy, what a time he had! He was the greatest.

Jim was 54 years old—we should say young. Really! He was a kid. He delighted in kids. Knew what they wanted. He could do more with a dime glider than some guys could do with an Astro Hog. He could do anything. He knew a million puzzlers to pinprick the experts—in many fields. He was the Pied Piper but he led us, little kids all, to bright places. He was the irreplaceable man.

► There's a picture somewhere of Jim tooting a funny horn, aimed at the sky. Overhead soared a glider, responding by sonic control to Jim's tooting. Testing his "noise makers" one night, Walker went down the quiet, residential street, laden with drums, whistles, and even a pistol. Someone called the law. A strapping cop found Jim blasting away in a vacant lot. The "sheriff" said, "That pop-gun is too small" and he cut loose with his cannon.

Irv Polk will never forget the day Walker said, "Here I'll show you this new U-control," and climbed out of the car by the general post office in New York and put the first Fireball into the air. Men climbed on bus tops. Taxis stopped. They called the riot squad. When the same thing happened in Chicago, a lone motorcycle cop roared up. Jim told him he was insulted and handed him the handle. Next thing you know, a Fireball had wrapped the motorized cowboy in 70 feet of line.

► Jim had a telephone in his car. One New York editor asked Jim where he was and the answer came, "In front of Joe's Hamburger Heaven." Where? In Oregon, of course. His imperial summons got us down in the 45th Street canyon. Another phone call summoned the (*Continued on page 7*)

NEXT MONTH'S COVER Waco 9

PLANE ON THE COVER

The Curtiss F9C-2 Sparrowhawk, often called the "Akron" fighter, was designed to be lowered and launched from the big dirigibles, Akron and Macon. To return to the mothership, the little fighter engaged a trapeze with the hook above its top wing. Power a 420 hp Wright Whirlwind, top speed 178 mph. Span was only 25½ feet.

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U.S. & POSSESSIONS: 1 year $3.50; 2 years $5.50; 3 years $7.50
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it's the famous . . .

OK CUB .049A

now only $3.95

***Complete with* FUEL-VUE NYLON TANK**
HIGH IMPACT PROPELLER • SPIN STARTER

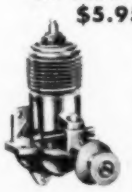
Yes! Here is the engine value of the year. It's the genuine OK Cub .049A engine at a never before heard of price. Our new attractive package saves you money. No need now for you to have any engine but the best. Ideal for both free and control line flight. Here are just a few of the exclusive OK features:

● Special Bearing Quality Die Cast Crankcase ● Hardened Aircraft Steel Crankshaft ● Fuel-vue Nylon Tank ● Patented 360° Porting ● Replaceable Glow Plug

"OK" CUB .049A DE LUXE PACK **$4.95**

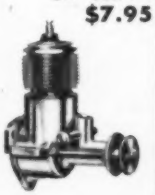
"OK" CUB .049B **$4.95**

"OK" CUB .074 **$5.95**

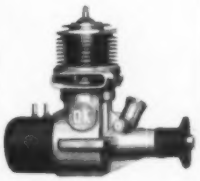


"OK" CUB .099 **$6.95**

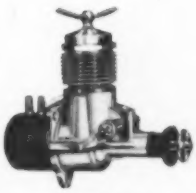
"OK" CUB .14 **$7.95**



"OK" CUB .19 **$7.95**



"OK" CUB .29 **$11.95**
"OK" CUB .35 **$12.95**



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.049 **$6.95**
.075 **$7.95**

OK GLOW FUEL
for Miniature Engines

Specifically developed to give maximum life and performance with all OK engines (and other engines of similar compression ratios), OK Glow Fuel is a scientifically compounded methanol-base fuel, heavily fortified with nitrates. High heat resistant silicone lubricants won't thin under engine heat.

½ Pt. 50¢; 1 Pt. 85¢; 1 Qt. $1.50

OK DIESEL FUEL for CUB DIESELS . . 85¢

OK GLOW PLUGS

"OK" Glow Plugs have a superior platinum glow element for fast starts, ease of acceleration, highest speed. Available in two sizes.

G-2 for Cubs 19, 29, 35 and all other makes using 1/4-32 long type plugs.

G-3 for all Cubs .039 to .14 and all other makes using 1/4-32 short type plug.

59¢

OK ACCESSORY SET

Just the right fuel . . . just the right accessories for satisfactory engine operation! Contains:

- ½ pint OK Glow Fuel
- 1 filler spout with tubing
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- 1 comb. plug wrench and screw driver

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COX .020 — "Pee Wee" Sensation that flies most ½A planes. 1½" high. Develops max. power at 18,000 RPM. 3.95

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Fox .29 or .35 — Two most popular sellers. Dependable performers. Gives you easy starts . . . easy handling. 15.95 EA.

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McCOY .19, .29 or .35 — We have 'em all . . . famous McCoy "Red Heads." We hear nothing but "raves" on these engines. 10.00 EA.

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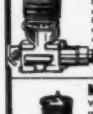
COOLING .29 — For Modelers who demand the finest. More horsepower per ounce of wt. than any other engine. 23.95



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Mito ... $5.95
Midget ... 6.95
Chemical's sensational ½A engines. Both with Automatic Starters.

O & R .049

Veco .29 or .35 — Excellent stunt power plants . . . very popular with model builders the world over. 15.95 EA.

Sky Fury Twins
.099 ... $9.95
.10 ... 11.95
Powerful twin engines — low priced. Sure power, low weight, easy installation.

JET ENGINES

PAA LOADER ... $1.98 — The terrific JETEX "100" . . . a high performance, solid fuel jet engine. Thrust 1¾ oz. Wt. ½ oz. Order now.

Jetex 50B — Thrust 4 oz. Ideal for most jet models. Economical. 98¢

DYNAJET "REDHEAD" 35.00

Holder of all world records for jets. Powerful gas engine develops 4¾ Lb. Thrust! Length 21½". Wt. 16 ounces.

MARINE ENGINES

Cameron .19 Water Cooled — Popular inboard marine engine that's loaded with power.

Single ... $14.95
Dbl. Jet 16.95

Sea Fury OUTBOARD .049 or .060 — Allyn's sensational outboard . . . model builder's choice.

10.95 EACH

ELECTRIC MOTORS

"WONDER" — Electric Motors — Powerful motors — Easy to install. 3 to 6 volt operation.

Direct Drive ... $1.65
10-1 Reduction ... 2.00
16-1 Reduction ... 2.00
100-1 Reduction 2.95
256-1 Reduction 3.50

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AMERICAN BOY ... $1.29 — Scientific's prolific U-Control trainer for ½A eng. (.020 to .074). 18" span. Ideal for beginners in control line.

ATOMIC ... $1.95 — Scientific's sensational little team racer for ½A engines. U-Control. All profab, carved balsa fuselage.

BABY CLOWN (P.D.Q.) 1.50 — Profile sport 'n stunt flyer for ½A eng. (.020 to .074). 22½" Span. Profab kit. An excellent performer.

CURTISS P-40F ... $4.75 — Hero's Monarch's deluxe U-Control flyer for engines up to .09. Has a 20" span. Profab for easy assembly.

FLIGHT STREAK ... $3.95 — Top Flite's popular combat or stunt profile flyer for .15 to .35 engines. 42" wingspan. Order from AHC!

FLYING CLOWN ... $1.95 — From P.D.Q. this popular 28" span profile model. Ideal for sport, stunt or combat flying. .19 to .35 eng.

GOLDEN HAWK 1.95 — Very colorful ½A model from Scientific. Has a big expansive wing. Profab, carved fuselage.

SMOOTHIE 7.95 — VECO's 52" contest winning stunter. Designed for windy weather. Wingspan 52". For .29 to .35 eng.

SPORT RACER 1.69 — Another Scientific kit with model builders. Has an 18" span, powers with any ½A engine. Ord. from AHC.

DUCTED FAN $4.95 — **"SKYRAY" P4D-1** — A dramatically exciting flyer from Berkeley. Ducted fan model for .049 engines. 23" span. ½" scale. Profab.

SNIFFER "29" 2.25 — Popular free flight model from "Midwest". Wingspan is 29". Powers with .020 to .049 engines. Order it!

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Gulliver Flying SCALE MODELS 1.29 ea.
18" spans. Rubber Pwr. WW I Heroes: SE8, Spad, Fokker D7. AVions, Nieuport, Sop. Camel

CLEVELAND "Custom" SF Series

SF-13	1917 Spad VIII	19" 3.50
SF-15	1917 Fokker D7	21" 3.25
SF-17	1931 "Gee Bee"	18" 4.00
SF-21	Curtiss Hawk P6E	24" 4.95
SF-29	Curtiss Goshawk	24" 5.95
SF-27	P40 "Warhawk"	30" 5.75
SF-79	P4U "Corsair"	30" 5.80
SF-86	P38 "Lightning"	30" 5.95

READY - TO - RUN

YELLOW JACKET 6.95 — Brand new WEN MAC gull wing ready to fly sensation. Big value outfit. Automatic starter. Real bargain!

READY TO FLY 8.95 — **COX "PITT'S SPECIAL"** — Complete with "Pee Wee" .020 Engine & automatic starter. All plastic model. 10" Wingspan. Order yours from AHC.

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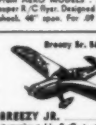
SPITFIRE ... $1.95 — Enterprise's scale flyer of this famous fighter. 18" Span. For ½A engines. Profab. Loads of detail!

NEW AERO "15" ... $10.95 — **R/C AERO 9** ... $7.95 — From AERO MODELS ... this very super R/C flyer. Designed to withstand shock. 48" span. For .09 to .15 eng.

LITTLE BIPE ... $1.50 — Scientific's big value control line "biplane" . . . for any ½A engine. A fine performer. Carved fuselage. 16" span.

STUNT MASTER 1.69 — ½A stunt model from Scientific. It's highly colorful. Powers with ½A engines. Profab, carved fuselage.



Breezy Jr. 56" $14.95 — **BREEZY JR.** ... $6.95 — Air unbreakable R/C stunt model from BABCOCK. For ½A Engines. .049 to .09. Span is 42". All profab kit.

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Bonus Items Includes: Tube of "REV-UP" Lubricant (makes your engine last twice as long), Ownership Decal, Correct Size Propeller, Glo Engine Handbook, Mounting Nuts & Bolts, Numeral & Alphabet Decals, etc., etc. FREE of extra cost

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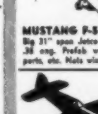
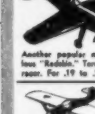


REDSKIN 5.25 — **HENRY ENG.** — Another popular model . . . the fabulous "Redskin." Terrific sport or team racer. For .19 to .35 eng. 31" span.



RINGMASTER ... $3.50 — A combat-stunt ace from STERLING for .29 to .35 eng. Profile, profab kit. Big 42" span. Order yours from AHC.

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BLAZER ½A 2.50 — C-G MODELS contest flyer for .049 engines. 48" Wingspan. A truly excellent performer. Order from AHC

FAIRCHILD PT-19 ... $6.95 — From Sterling. R/C sensation. Pre-shaped inter-notch construction. 48" span. Powers with .09 to .60 engines.

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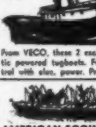
From VECO, these 2 excitingly realistic powered tugboats. For R/C control with elec. power. Profab kits.



AMERICAN SCOUT ... $14.95 — Amazingly authentic U.S. Line's Cargo Ship. 80" long, by "Sterling". For elec. or gas power, ideal for R/C. 339 Pc. Fitting Set ... $10.95

Fitting Set $9.95

42" CORVETTE ... $26.95 — Sterling's exciting Chris-Craft model. An R/C fan's dream performer. 48" long. 14" beam. All prefabricated.

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MUSTANG P-51 ... $12.95 — Comet's all plastic, two-tone beauty. Has an OK Cub engine w/auto. Rescoil starter. 14" wingspan. Delaxe.

SUPER CUB 10S 7.95 — Realistic, smooth flying COX model. All-impact plastic. Comes with Thimble Drome .049 engine. 17½" wingspan.

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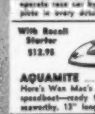
O & R MOTORJET 14.95 — All metal racer. Starts and launches automatically. Has an .049 engine with automatic starter. A real beast!

Wen Recoil Starter ... $13.95 — **AUTOMITE** ... $12.95 — Speeds at 35 mph. A truly fun to operate race car by Wen Mac. Complete in every detail. Plastic.



With Recoil Starter $12.95 — **AQUAMITE** ... $10.95 — Here's Wen Mac's extremely popular speedboat—ready to run and super maneuvrby. 13" long. All plastic.

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FAMOUS MERCO PLASTIC SPINNERS

Colors: Yel. Blk. Silv. Blue. Red. Grn.

1½" Diam.	Nicodel Nose or Hub	.39
1⅝"	2" or 2½" Needlemen	.39
1⅝", 1¾", 2" or 2½" Sed.		.39

Engine Accessory Kit

OZ Cub. For all model engines. Has: fuel, speed, battery leads, prop wrench, etc.

1.39

U-REELY — Our most popular general handle.

Int. Wire	$7.95
Braided .018	8.95
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MAGNESIUM SPEED PANS

	Top	Bttm.	Cowl	Stack	Wing
½A	2.40	1.95		.25	
A	2.95	2.95	2.50	.46	3.50
B	3.45	3.45	2.75	1.00	4.00
C	3.95	3.95	3.00	1.15	4.50

LOOK!

TIGER JET ENGINE

REG. $19.95 — Save $10.00 on the powerful jet type engine with a 2¼ lb. thrust. Quick starting & easy to teach. Professional. 18½" long. 9.95 AN AMC SUPER BUY

ATWOOD CADET .049 GLO ENGINE

SAVE $2.95 — DELUXE ATWOOD SUNBEAM .049 GLO. SOLD FOR 3.95 $6.95

PROP ROD ... $9.95 — Cox's streamlined, colorful racer . . . 12" long. With an .049 Babe Box eng. Unbreakable spring starter, too!

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MAN at Work

(*Continued from page 4*)

toy buyer of the swankiest department store in the city. He came. Jim knew more people than Ike. So we all flew Ceiling Walkers to the very tops of the buildings. He got into a big night-time parade up Broadway and, having slipped the keeper of the searchlight a ten spot, had the guy spotlighting Ceiling Walkers and Interceptors that blitzed Times Square.

► At a trade-show seance in Chicago, Ed Lidgard made a pitch for the Wakefield team. "I'm tired of all this discussion," said Jim. "Here's a check for $5,000." Like we said, Walker had no equals . . . at a Dallas Nationals, with a station wagon full of Firebabies, giving one to anybody who could fly one . . . tossing hand gliders, one, two, three at a time, picking them out of the air as they floated in from all directions, never missing one—at many nationals, kids ten deep . . . at Minneapolis in '47, when young Slagle was the wizard in stunt; try this, said, Jim, with a plain old Fireball and even Slagle couldn't do it like Jim. A Fireball soaring high against the sky on 200-foot lines. Jim would start a plane in his hand, dart out of the crowd, unreeling the lines as he went and, after the flight, would come back the same way, the ship ending its glide with wound-in lines—on his hand.

► He flew three Fireballs at once in the Nats Sunday show wind-up for many years. Lately, he made it four at once. When the doc said get a "hobby," Jim ran model railroads and golf into the ground. He became an expert, pronto. Have seen him take the Nats radio with one flight at the very end of the meet . . . he gimmicked an RC lawnmower. One evening, by ourselves at the old Curtiss Field, N. Y., Jim drove in and we "stunted" the mower in the dark. He'd pop up anywhere. That mower made all the mags, parades, shows, for years. Said he was too lazy to cut the lawn. He'd hold a Fireball motionless, vertical in the air and back down to break a balloon with a pin in the tail! He could, he could . . .

All his products were ahead of their time. The Interceptor, Hornet, etc., go back before the war and you cannot beat them. Two generations! No one ever found a piece of bad wood in his kits. He invented U-control. The pressure tank and regulator. The U-Reely handle.

By his trailer in the soft Kansas night, in Dallas motels, Chicago and New York Hotels, on flying fields everywhere, we've yarned with him—as dad many others. You knew him, too, Everytime you pick up a control handle, you'll think of Jim Walker.

Additional June 15th Contests

Complete listing, page 59

15—*Meadville, Pa.* (AA) "Mark I" R/C Model Contest. L. V. Mazura, C.D., 590 Randolph St., Meadville, Pa.

15—*Sacramento, Calif.* (A) Northern California Free Flight Council Contest for FFG and TLG. Restricted to NCFFC members. Bruce Hannah, C.D., 2518 Furmint Way, Rancho Cordova, Calif.

15—*Los Alamitos, Calif.* (AA) Thunderbugs' Seventh Annual PAA-Load Meet for PL and CC. F. L. Swaney & Jim Scarborough, C.D.'s, 527 E. 55th St., Long Beach, Calif.

15—*Baltimore, Md.* (AA) Aerocraftsmen "Pro" Contest for FFG. N. L. Rhodes, C.D., 508 Epsom Rd., Baltimore 4, Md.

15—*Pittsburgh, Pa.* (A) A.R.C.S. First Radio Control Air Show. Fred J. Collins, C.D., 29 Stewart Ave., Pittsburgh 27, Pa.

Radio AHC Control

NEW . . . an unbeatable R/C Combination that Challenges ANY COMPARISON!

AMTRON "Vanguard" TWIN TUBE R/C OUTFIT PRINTED CIRCUIT

Here's the Precision Equipment You Always Wanted . . . at a Fraction of What You'd Expect to Pay!

We ask every R/C fan to order and compare this truly precision engineered R/C equipment. Examine it for 14 DAYS FREE! If you aren't convinced that it's equal to and superior to ANY SET selling up to twice the price, return it for full refund! No Questions Asked!

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From ½A to the Very Largest ● Up to 1½ Miles

"VANGUARD" RECEIVER is a superior quality outfit—unmatched for reliability, accuracy and performance. It will fit into just about any model you can find, weighs a mere 1½ ounces (including relay) and measures 1½" x 2" x 1". Despite its light weight and compact design, it is one of the finest precision R/C instruments ever made. Other features include: One stage single tuning ● All printed circuits ● Twin diodes ● Accurate & positive pin point control at all ranges ● Low .15 battery drain as compared with .3 or .4 on most receivers ● Saves you countless $$$ on battery costs ● No pot required ● 22½ Volt battery operation ● Transmitter that eliminates sensitivity control ● New improved 1AG4 tubes ● Super sensitive 5000 Ohm Jaico relay ● Plastic case ● All prefabricated & easy to assemble ● Complete Instructions & Diagrams Included.

SALE PRICED AT LESS THAN THE REGULAR WHOLESALE COST !

"VANGUARD" TRANSMITTER is a powerful output instrument with all the precision components found only in the most expensive units. It has a simplified built-in tuning indicator with a one adjustment feature. Tuning-Eye light for E-Z checking. Printed Circuit Chasis. Exclusive new design that reduces "B" battery drain, yet supplies maximum power output. Other quality features include: Deluxe Crystal, Powerful 3A4 Tube, Handsome portable Aluminum case that you can easily hold in your hand and really easy to assemble construction. The step-by-step assembly instructions are a cinch to follow. R/C fans who have seen the "VANGUARD" TRANSMITTER tell us its the biggest bargain they ever saw — equal in power and quality to the most expensive!

GET BOTH THE RECEIVER AND TRANSMITTER KITS Both for only $24.95

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ASSEMBLED OUTFIT
Same as Above, But Ready-To-Operate $34.95
ALL "FINISHED, TESTED AND ASSEMBLED READY FOR USE.

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AHC's BIG BARGAIN
AMTRON SUPER "27"
Guaranteed to Work!
No Junk Parts ● No Coils to Wind

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A real buy! Complete! Wired, adjusted and Ready-to-Operate. In plastic case. "AMTRON"

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(2) Citizenship RER	39.95
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(5)	86.00 (6) 91.75

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(3) Citizenship REX (Assembled	39.95
(5) CG T5 (Assembled)	79.95
(8) Citizenship MST-8	99.95
RAYTROL (3) (Assembled)	66.00
(5)	98.75 (6) 99.00

R C Parts & Accessories

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Special buy! Authentic scale U-C models. Prefab bits. Take your pick.

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Finest quality. Silk colors: Yellow, Blue, Red or White. Nylon: Yellow or White. Reg. $1.50 a yd.

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Reg. 50c. With hardened 1" steel cutter, 5⅝" long. A real bargain!

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2 PLANE OUTFIT

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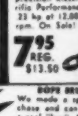

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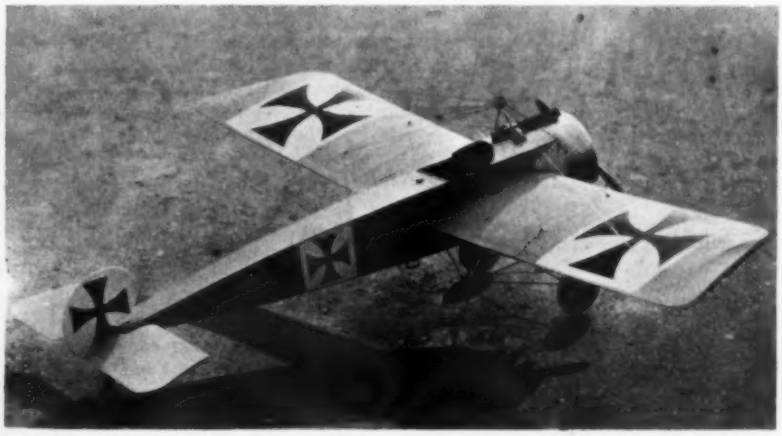
At the 1957 Nationals where this picture was taken our E-111 was one of the most talked about jobs. Photographer Bill Dean played a hunch and took candid pic of author and ship.

FOKKER E-111

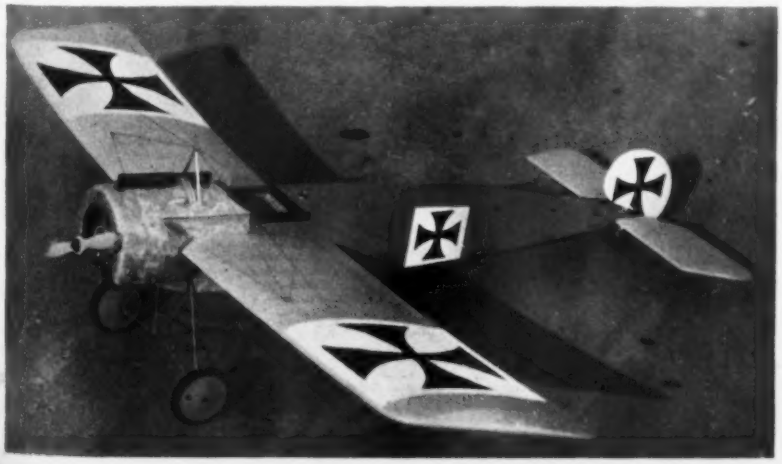
by NORMAN DEITCHMAN

Superb craftsmanship and feeling design make this Half A-powered, free-flight model a memorable project. Airplanes like this are few and far between.



In 1915 men flew things like this in combat; and there were no chutes either. The parallel edges and boxy lines make the basic airplane a cinch to duplicate. Spidery wires test you!

Flying wires are rubber-band loaded to allow a little give in flight and on hard landings. The cowl and nose were covered with aluminum foil—a realistic effect. Note the machine gun.



The Fokker E-1, a converted M.14 monoplane, was the first aircraft in history to carry a synchronized machine gun to fire through the whirling propeller blades without hitting them. The impact of this deadly development was so great on allied airmen that the E-1 was dubbed the "Fokker Scourge." For six terrifying months, the German Air Force reigned supreme and the name Fokker became famous.

Our model, the E-111, appeared late in 1915. (I take this opportunity to thank Mr. H. A. Somberg, N.V.K.N.V., Fokker for his very helpful information about this machine.) Basic drawings were scaled up from Joe Nieto's plans in Oct. '51, MAN, where extra details can be picked up for the exacting builder. Study the plans until you can assemble each part in your mind. Select your wood carefully. A little extra patience will give a large reward and a scale model to be proud of.

A few items will require patience, no problem to scale modelers. Since all scale models differ as all real aircraft do, each airplane has its own peculiarities. This plane has two, the landing gear and the elevator installation. These two main problems have been worked out satisfactorily.

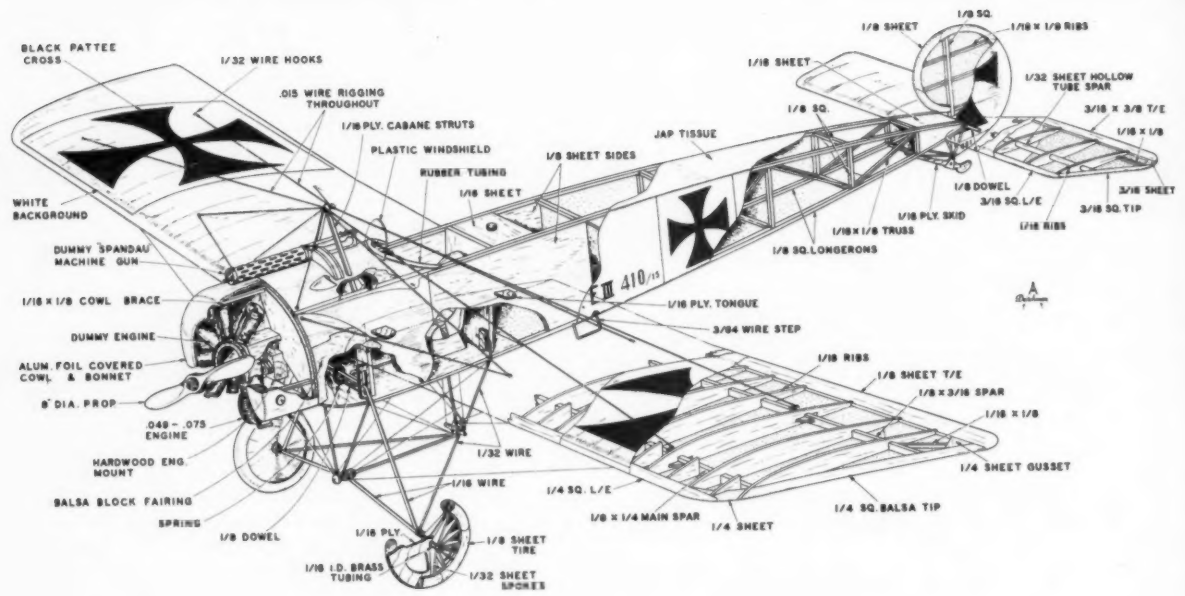
Fuselage: Cut out 1/8" sheet sides and formers F-1, F-2, and F-3. Build two fuselage sides and assemble basic fuselage by adding formers and cross braces. Cement 1/16" ply dihedral braces in place where shown on formers, checking angle. Cement small lengths of 1/8" sq. balsa above and below braces on formers to give added strength.

Carefully make the two 3/32" plywood landing gear supports F-4, making certain that the 1/16" slots allow the wire to slide up and down freely. Cut 1/8" anchor dowel to length shown, cement into holes and, while still wet, cement entire assembly into fuselage up against bulkhead No. 2. When dry, double cement.

Use small rat-tail file and cut groove at fuselage rear to accept elevator pivot dowel and cement it in place. When dry, wrap with thin strip of silk. Cut notch in center and cement rudder post in place. Wrap this with silk also.

If McCoy .049 Diesel is used, cut out mounting block. Drill firewall and block to accept engine bolts; mount engine; solder nuts to brass or tin sheet cemented to back of firewall and then remove engine. Install 80-second tank in convenient position running the necessary filler tubes out for accessibility.

(*Continued next page*)



Bend all the wire landing gear parts to shape. Cement front and rear 1/32" legs into place using small plywood braces to hold in place. (Don't worry about wiggle.) Slip 1/16" pivot wire through both loops at bottom and make sure they are aligned. Remove 1/16" pivot wire, add two washers and the axle to it. Solder the washers against axle but not to it. This will allow axle to swing freely but not slide forward or backward. Slip unit back into legs.

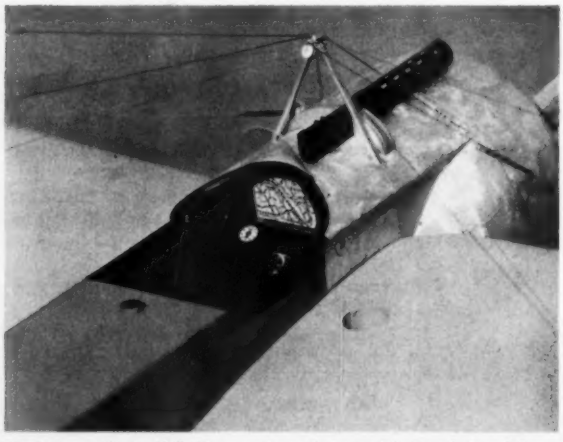
Carefully thread main gear through landing gear supports in fuselage. Solder the free ends of a small spring to the center of the main leg after wrapping around anchor dowel. Springs of this type may be purchased at a radio supply house. Wrap and solder main leg to axle and 1/32" legs to 1/16" pivot wire. Solder remaining 1/32" wires in place. To complete landing gear, solder in the .015 cross bracing wires. They will make rigid the entire undercarriage and must not be left out. The gear will now absorb shock as the real one did.

Wing: Cut trailing edges out of medium hard 1/8" sheet. Note the one-degree rake (slants out and rear) which make the wing chord wider at the tips than at the roots. False ribs may be cut out of hard quarter-grained 1/32" sheet, if desired. Assemble wing halves in the usual manner, noting the slots in ribs 1 and 2. Cut slots carefully to size as a sloppy fit may cause wing misalignment. Observation hole was made out of sanded down 1/32" sheet cut slightly longer than rib section, cemented in place and, when dry, sanded to conform with wing section. Add hooks to spars, bind with thread or thin copper wire and cement well, as these hooks must take the stress of flying, landing and the rubber tension of the brace wires.

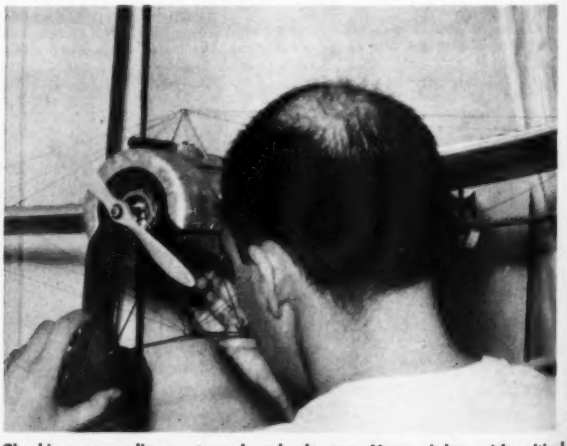
Plug the wings into the plywood tongues. They may droop slightly at this point but will be corrected shortly. Tie thin sewing thread from outer hooks to cabane strut, lifting each tip from 1" to 1½". (Minimum dihedral may be used but extreme care must be taken when adjusting for flight.) My original had one inch.

While wings are in this position, build a box out of 1/16" hard sheet wood around each tongue in wing, being careful not to cement to tongue itself. When thoroughly dry, wings should be removed. Sand slight angle onto rib 1 to conform to dihedral angle. Sand entire wing smooth.

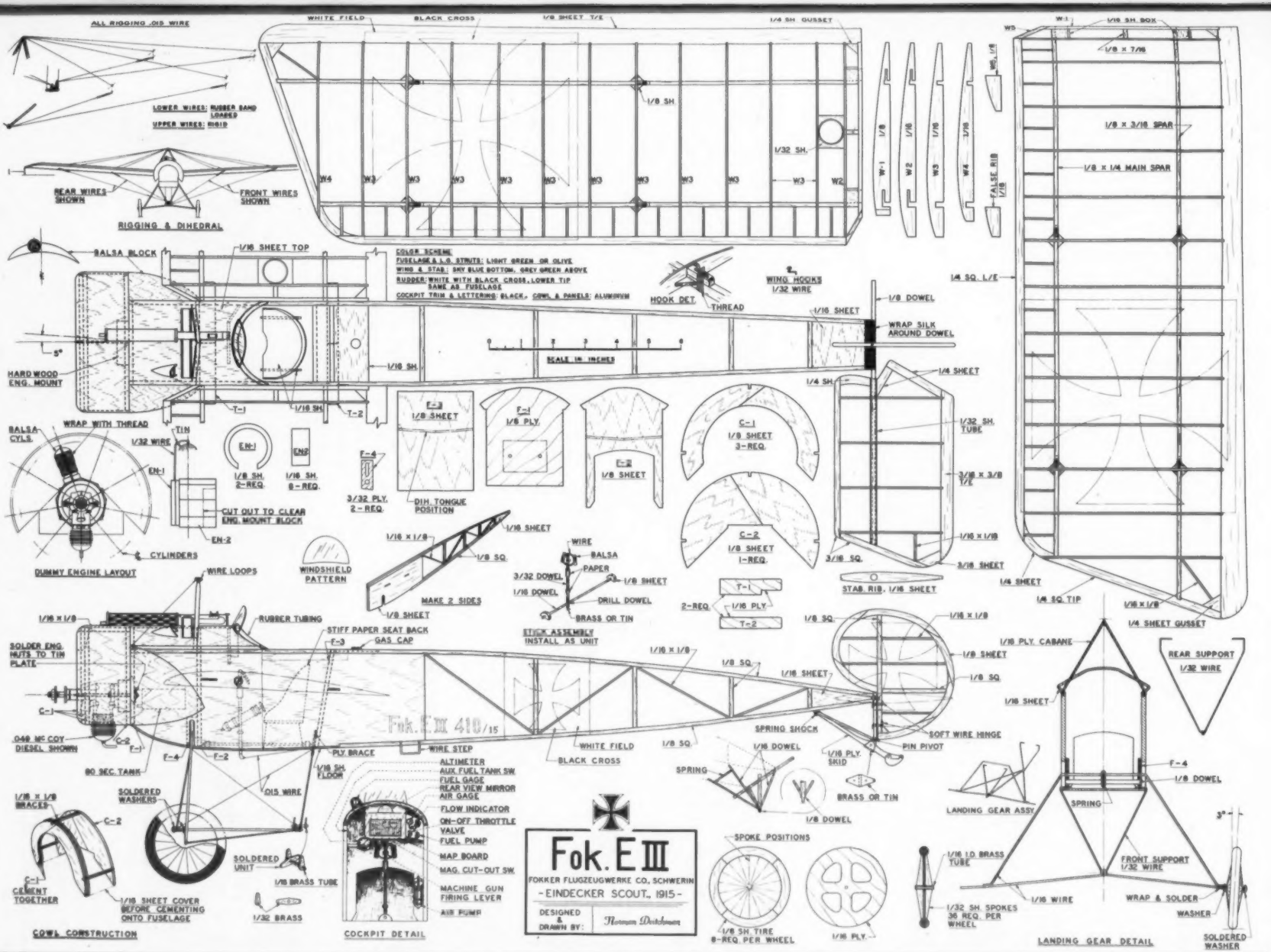
Rudder and Stab: Cut rudder (*Continued on page* 61)



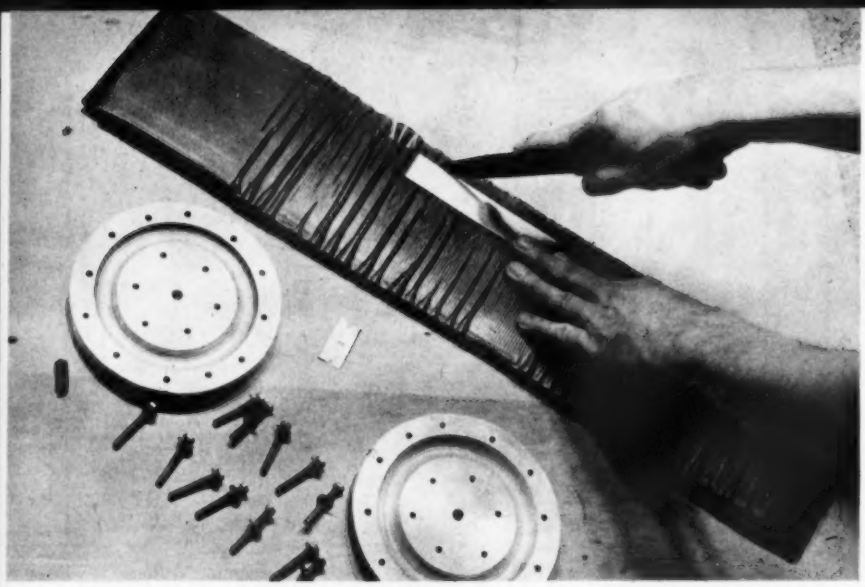
Check 'em off: battlefield map in cockpit, padded cockpit edging; a step below scale marking, the control pulley at top of strut pylon.



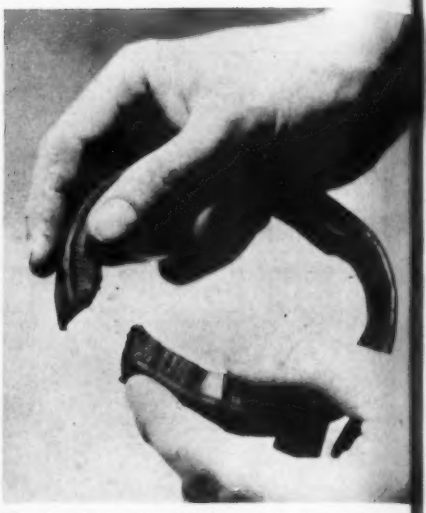
Checking gear alignment—scale wheels, too, Norm sights with critical eye. The Mac Diesel he used, hidden behind the lower propeller blade.



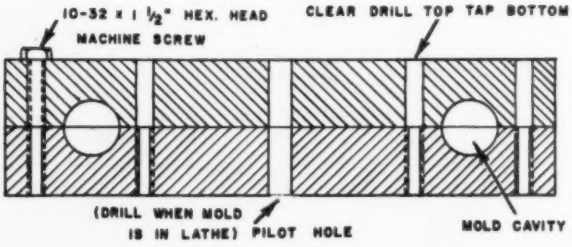
FULL SIZE PLANS AVAILABLE. SEE PAGE 60



1. Cutting strip of "camel back" rubber from recapping shop. Mold lathe-turned by a friend. If done in machine shop, should cost from $3 to $7. Rubber pieces in mold will bond.



2. Forming strip of rubber into ring—note bevel joint. Mold halves clamp together.



Scale Tires Mold Your Own

by J. WARREN KOHLER

► Have you ever had the annoying experience of building a sweet scale World War 1 model only to be stuck for a thin-tired wheel to suit? This is a problem with which I was recently faced. I am building a 2" to 1' scale World War 1, German "Albatros" D-VA. In this scale the tire is 3⅜' diameter at the rim and ⅝" diameter in cross-section. I contacted every manufacturer of model wheels and industrial "O" rings in an attempt to secure a rubber tire to suit—all to no avail.

A friend and co-worker of mine suggested that I mold my own from tire re-capping rubber. I have done this and the process can be duplicated by almost any model-builder to fill his needs.

I bought a scrap piece of ¾" x 6" x 12" aluminum tooling plate through a friend that works in one of our Long Island aircraft plants. This cost $1.50. The friend that suggested this project, lathe-turned the mold cavity for me. This lathe work, if done in a machine shop, may run from $3.00 to $7.00, depending on the amount of work involved.

I contacted a tire re-capping shop and presented the owner with my problems and showed him my mold. I was given a large quantity of scrap "camel-back." This is the raw rubber used in re-treading a tire. This rubber comes in a roll a shade thicker than ⅛" by about 8" wide and has a plastic protective sheet over the bonding surface that would normally be applied to the old tire. "Camel-back" has about the same feel as an auto tire, it is just uncured. The rubber vulcanizes or "cures" by the application of heat and pressure.

The mold can be filled, if necessary, with any number of small pieces of rubber placed closely together and, provided they are first cleaned with acetone, white gas or naptha, they will flow together and bond. However, I suggest whenever possible to use one or two pieces with a miter joint of 30° to 45°. In this do-it-yourself process the pressure for curing results from excess rubber in the mold. The correct amount must be ascertained by some trial and error. The cross section of my tire is ⅝" diameter and the best results were obtained with a rectangular cross section ⅜" x ⅝". Too much rubber will give an excess of "flash" which is the feathered piece at the mold parting line; too little rubber will result in a gassy or spongy tire with strong chance of a bubbled surface.

Pre-heat the mold in your home oven, with the thermostat set at 300° F. Heat until you're sure that the mold is up to temperature. In my case this took 20 minutes. A word of caution: this is 88° hotter than boiling water.

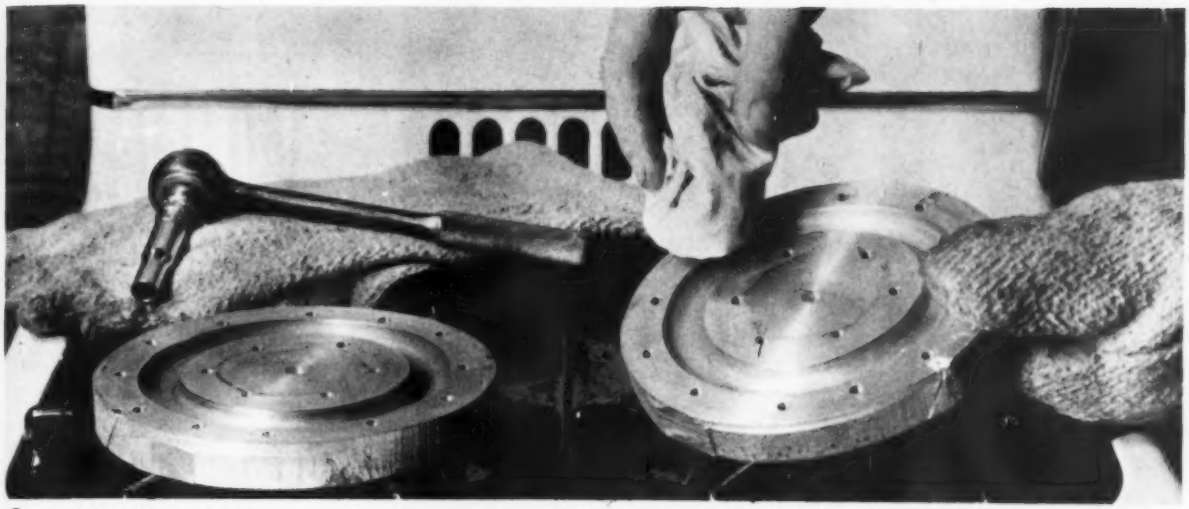
Lubricate the mold with a rich solution of soapy water applied with a rag or brush. Place the rubber in the mold and tighten with screws or clamps.

Return it to the oven and "cook" it for five to seven minutes per 1/32" of tire thickness, i.e. ⅝" dia. =20/32, 20 x 5 = 100 minutes or one hour and 40 minutes. I was told by the owner of the tire shop that one hour of over cooking was better than removing the mold 20 minutes too soon.

Now remove the mold from the heat (asbestos gloves are best but a good pot holder will work), open the clamps or remove the screws, pry open the mold and there is your tire. The flash may be removed with a sharp razor blade; however better blending is obtained with a motorized wire brush.

By the way, you may have to reassure your mother or wife that she will not be driven from the house by choking fumes, nor will her oven be caked with melted rubber. The process is very clean and there is only a slight odor which dissipates rapidly.

Now that tires are no longer a problem let's have more of those swell ships reproduced in scale.



3. Mold first lubricated with soapy water, after preheating mold in oven 20 minutes at 300 degrees. Rather hot, so handle with gloves.

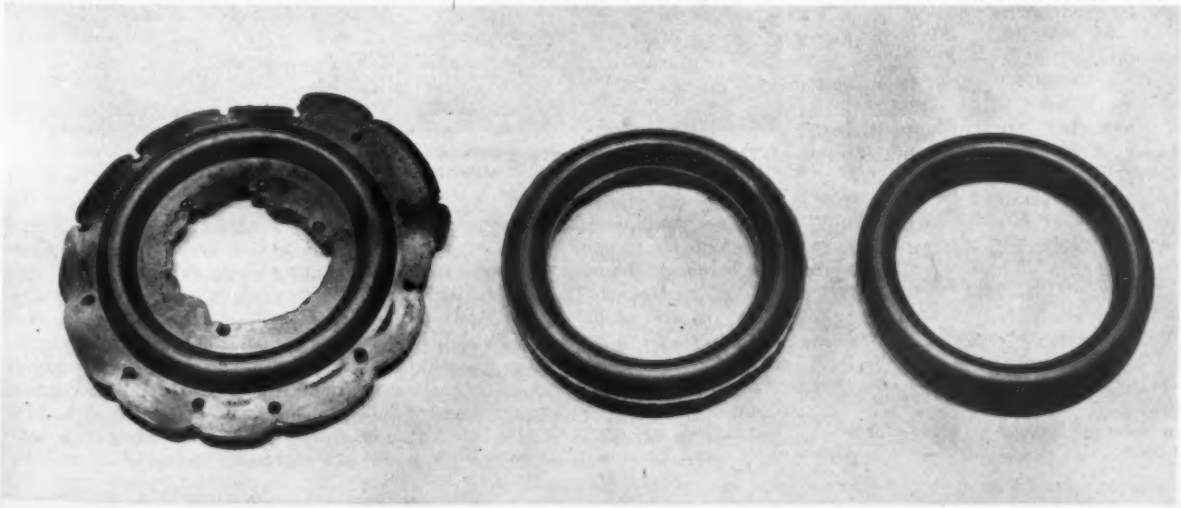
There is no greater outrage to the scale modeler's eye than a balloon-tired wheel on, say, a SPAD. Having exhausted all other possibilities, author came up with this do-it-yourselfer.

4. Inserting rubber in mold. Now is cooked 5 to 7 minutes for each 1/32 of thickness.

5. Locking up mold before cooking. The rubber will flow due to heat. Overcook ok.

6. Opening mold reveals finished tire. "Flash" removed razor. Too little rubber, spongy.

7. Left—Excess "flash" due to too much rubber. Center—Correct amount of rubber, "flash" not over ⅛ inch. Right—Tire ready to use.



The good fuselage combat ship will beat "wing" hands down, says Bill Judge, here cranking up his profile terror. But you have to know what to do with the "fuse" job. Judge explains deal.

WOODY

by BILL JUDGE

From the Rocky Mountain Region, combat job that licks its weight in wild cats. Sea-level jobs can't touch it—nor anything else—'tis said.

► Here, in the Rocky Mountain region, the combat has become the most popular event on the program ever since elimination combat has become the rule rather than the exception. When you reach the finals from a field of more than 32 contestants, you've traveled a hard and rocky road.

Out here in the "high" country we wish that just once a Nationals could be held at the elevation above sea level that is common here in the Rockies. At this altitude, sea-level models, motors and props, operate at an approximate loss of 20% in efficiency. Less than half of this is recoverable in motor and prop compensation. As a consequence, there is considerable difference in the performance of a model designed for low-altitude work, operating at a high altitude.

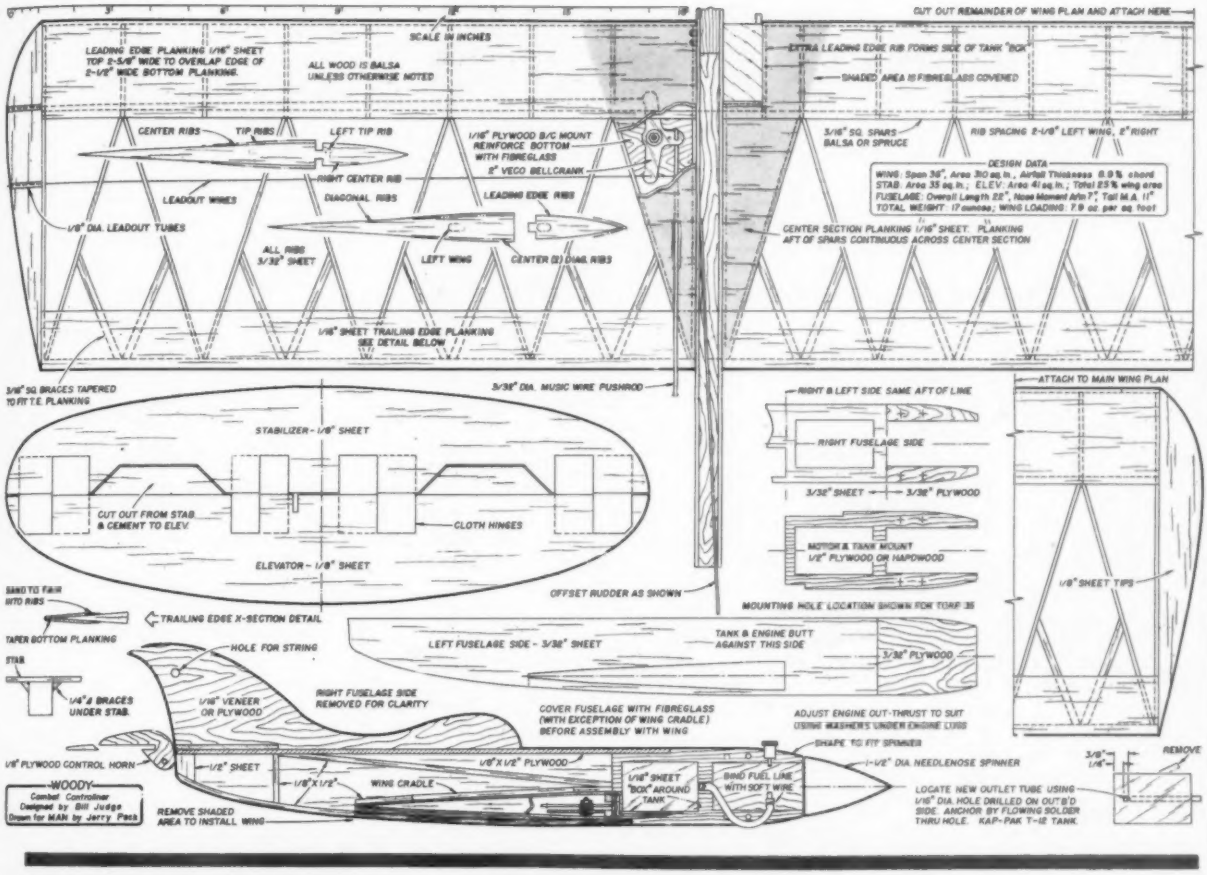
On the other hand, the model that performs well in high altitude will not suffer in efficiency when flown at lower altitude. Without that friendly cushion of denser air to work with, mistakes in design or flight show up rapidly and disastrously with the "sea-level" jobs.

Combat models must be designed for speed, maneuverability and durability. Each feature of the model must have its complimenting part in the person of the contestant. He must have an aggressive will, fast reflexes, stamina and experience. The combination that coordinates the best features of both pilot and model will result in the winning contestant.

There are three basic types of combat models: the wing, the fuselage type with the long nose- and tail-moment arms, and the compromise between the two extremes, the semi-wing type.

If you haven't tried balanced flippers, you'd better bring yourself up to date. Five years winning against them all evolved a functional sure-fire design stressing offense as best defense.

The long fuselage type is best exemplified by the profile fuselage kits on the market. When combat first took hold in the Rockies, these were the most popular combat models. Then the "wings" took over and the profiles were overlooked but recently the profiles have been making a comeback in a lightened form. The object is to remove all unnecessary and useless weight to bring them down to around 17 ounces of dry weight. This is done by channeling the leading edge, removing a strip from the top and bottom of the fuselage, shortening the nose and tail moment arms to combat proportion, boring holes through the trailing edge or replacing the solid wood with 1/16 in. planking. The new look in the pro-


SCALE IN INCHES
LEADING EDGE PLANKING 1/16" SHEET TOP 2-5/8" WIDE TO OVERLAP EDGE OF 2-1/8" WIDE BOTTOM PLANKING.
ALL WOOD IS BALSA UNLESS OTHERWISE NOTED
CUT OUT REMAINDER OF WING PLAN AND ATTACH HERE
EXTRA LEADING EDGE RIB FORMS SIDE OF TANK "BOX"
SHADED AREA IS FIBREGLASS COVERED
CENTER RIBS
TIP RIBS
LEFT TIP RIB
RIGHT CENTER RIB
1/16" PLYWOOD B/C MOUNT REINFORCE BOTTOM WITH FIBREGLASS
2" VECO BELLCRANK
LEADOUT WIRES
DIAGONAL RIBS
LEADING EDGE RIBS
1/8" DIA. LEADOUT TUBES
ALL RIBS 3/32" SHEET
LEFT WING
CENTER (2) DIAG. RIBS
3/16" SQ. SPARS BALSA OR SPRUCE
RIB SPACING 2-1/8" LEFT WING, 2" RIGHT
DESIGN DATA
WING: Span 36", Area 310 sq. in., Airfoil Thickness 8.9% chord
STAB: Area 35 sq. in.; ELEV: Area 41 sq. in.; Total 23% wing area
FUSELAGE: Overall Length 28", Nose Moment Arm 7", Tail M.A. 11"
TOTAL WEIGHT: 17 ounces; WING LOADING: 7.9 oz. per sq. foot
CENTER SECTION PLANKING 1/16" SHEET. PLANKING AFT OF SPARS CONTINUOUS ACROSS CENTER SECTION
1/16" SHEET TRAILING EDGE PLANKING SEE DETAIL BELOW
3/16" SQ. BRACES TAPERED TO FIT T.E. PLANKING
3/32" DIA. MUSIC WIRE PUSHROD
STABILIZER - 1/8" SHEET
CUT OUT FROM STAB & CEMENT TO ELEV.
CLOTH HINGES
ELEVATOR - 1/8" SHEET
OFFSET RUDDER AS SHOWN
RIGHT & LEFT SIDE SAME AFT OF LINE
RIGHT FUSELAGE SIDE
3/32" SHEET
3/32" PLYWOOD
MOTOR & TANK MOUNT 1/8" PLYWOOD OR HARDWOOD
ATTACH TO MAIN WING PLAN
1/8" SHEET TIPS
MOUNTING HOLE LOCATION SHOWN FOR TORP .35
SAND TO FAIR INTO RIBS
TRAILING EDGE X-SECTION DETAIL
TAPER BOTTOM PLANKING
STAB
HOLE FOR STRING
1/16" VENEER OR PLYWOOD
1/4"a BRACES UNDER STAB.
RIGHT FUSELAGE SIDE REMOVED FOR CLARITY
LEFT FUSELAGE SIDE - 3/32" SHEET
TANK & ENGINE BUTT AGAINST THIS SIDE
3/32" PLYWOOD
COVER FUSELAGE WITH FIBREGLASS (WITH EXCEPTION OF WING CRADLE) BEFORE ASSEMBLY WITH WING
ADJUST ENGINE OUT-THRUST TO SUIT USING WASHERS UNDER ENGINE LUGS
SHAPE TO FIT SPINNER
1/8" PLYWOOD CONTROL HORN
1/8" SHEET
1/8"X1/2"
WING CRADLE
1/8"X1/2" PLYWOOD
1/16" SHEET "BOX" AROUND TANK
BIND FUEL LINE WITH SOFT WIRE
1-1/2" DIA. NEEDLENOSE SPINNER
3/8"
1/4"
REMOVE
LOCATE NEW OUTLET TUBE USING 1/16" DIA. HOLE DRILLED ON OUT'B'D SIDE. ANCHOR BY FLOWING SOLDER THRU HOLE. KAP-PAK T-15 TANK.
WOODY
Combat Controliner
Designed by Bill Judge
Drawn for MAN by Jerry Pack
REMOVE SHADED AREA TO INSTALL WING

FULL SIZE PLANS AVAILABLE. SEE PAGE 60

Streamer is attached to fin by author. Thousands of bouts with quick-reflex kids required a fast but easy-to-fly machine—and a few tricks up a pilot's sleeve. Plans and dope put you in there!

file models results in higher speed and even greater reaction.

The comeback of the profile fuselage model is the result of the failure of many wing and semi-wing types not living up to their advance publicity. At high altitudes, it was found that the wing simply did not cut the mustard. Now the pendulum has swung against them. For awhile, the combat contestant would just as soon have appeared in the ring in his birthday suit, as have appeared without a wing combat model. As long as most everyone was flying wings everything was pretty even, until someone discovered that although the wing was most popular, some other type was generally in the winners circle after the final bout.

In the hands of the expert who can make allowances for their faults and exploit their advantages, the wing is a formidable combat weapon. But the wing is not the final answer, nor the ultimate for all contestants.

The wing type of design answered the demand for a combat model of quick response in turning or cornering ability. There is no reasonable proof that it is superior in prolonged maneuvers or in level high-speed flight. In addition to this, the skill necessary to get the most out of a wing is too much for anyone not specializing in its use.

The average contestant in an average contest is one who must spread his talents among several events to improve his chances of taking the hardware home with him. He cannot afford to risk all of his chances in one event.

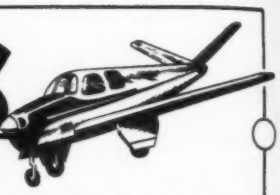
For his sake, let's explode the fallacies surrounding the wing before they become even firmly accepted as facts.

What is turning ability? Maybe it is time to pause a bit, apply common sense and return to fundamentals. I once read a story in a magazine of a combat model that at 100 mph could turn a ten-foot diameter circle. I would like to see any combat model that could enter a three-sided ten-foot room, start its turn after entering and complete a loop without touching the floor, walls or ceiling at a speed of 100 mph!

(*Continued on page* 38)

HANDY HINTS

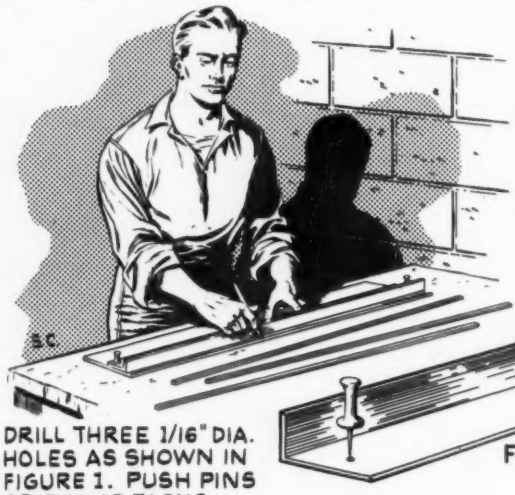
FOR THE MODEL BUILDER



By Harry Williamson & Stan Campbell

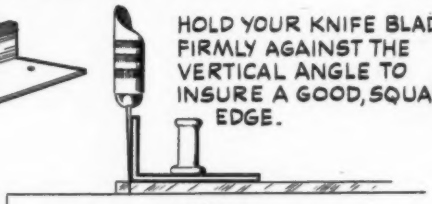
CUTTING TOOLS AND HOW TO USE THEM

WASTE NOT, WANT NOT... A GOOD RULE TO FOLLOW ANY TIME, ESPECIALLY WHEN YOU START CARVING OR STRIPPING BALSA BLOCKS AND SHEETS FOR THAT MODEL ON YOUR WORK TABLE. IMPROPER TOOLS OR METHODS CAN EASILY RUIN THE MATERIAL FURNISHED IN YOUR KIT AND RESULT IN YOUR HAVING TO BUY NEW MATERIAL AND DOING THE JOB OVER... A WASTE OF TIME AND MONEY. A GOOD WAY TO CUT FUSELAGE COVERING SECTIONS OR STRIP SHEET BALSA IS SHOWN AT THE LEFT. THE MODELER IS USING A STRIP OF ANGLED ALUMINUM (AVAILABLE AT MOST HARDWARE STORES OR LUMBER DEALERS) THIRTY SEVEN INCHES LONG BY 1/8 INCH THICK, AND HOLDS BOTH BALSA AND STRIP STEADY BY INSERTING PUSH PINS OR THUMB TACKS THROUGH HOLES IN THE STRIP AS SHOWN IN FIGURE 1.



DRILL THREE 1/16" DIA. HOLES AS SHOWN IN FIGURE 1. PUSH PINS OR THUMB TACKS INSERTED IN THESE HOLES AS SHOWN IN FIGURE 2 HOLD MATERIAL AND STRIPPING EDGE FIRM. FOR 1/8" SQ. STRINGERS, USE A 1/8" THICK SHEET, MOVING THE STRIPPING EDGE BACK 1/8" AND RE-INSERTING THE PUSH PINS FOR EACH STRINGER REQUIRED.

FIG.1



HOLD YOUR KNIFE BLADE FIRMLY AGAINST THE VERTICAL ANGLE TO INSURE A GOOD, SQUARE EDGE.

FIG.2

WHENEVER POSSIBLE, SELECT CLEAR SHEET STOCK WITH THE GRAIN RUNNING PARALLEL TO THE SHEET EDGES FOR MAXIMUM STRENGTH AND STRIPPING EASE. IF THIS IS NOT POSSIBLE, THEN STRIP IN THE DIRECTION SHOWN IN FIGURE 3 SO THAT THE GRAIN WILL DIRECT THE KNIFE BLADE AGAINST THE EDGE OF THE METAL STRIP. IF CUT IS MADE IN THE OTHER DIRECTION, THE GRAIN WILL TEND TO DIRECT THE BLADE AWAY FROM THE STRIP, OFTEN RESULTING IN A WAVERING CUT AND IRREGULAR WIDTH STRIPS.

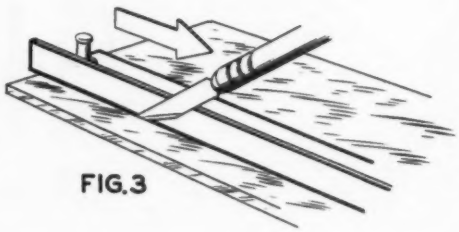


FIG.3

IN CUTTING FUSELAGE SECTIONS, ELEVATORS, RUDDERS, LANDING GEAR SECTIONS, ETC. OUT OF SHEET BALSA IT IS IMPOSSIBLE TO MAKE ALL CUTS IN THE DIRECTION OF THE GRAIN. APPLY THE RULE ILLUSTRATED IN FIGURE 3 AS SHOWN IN THE DRAWINGS BELOW...

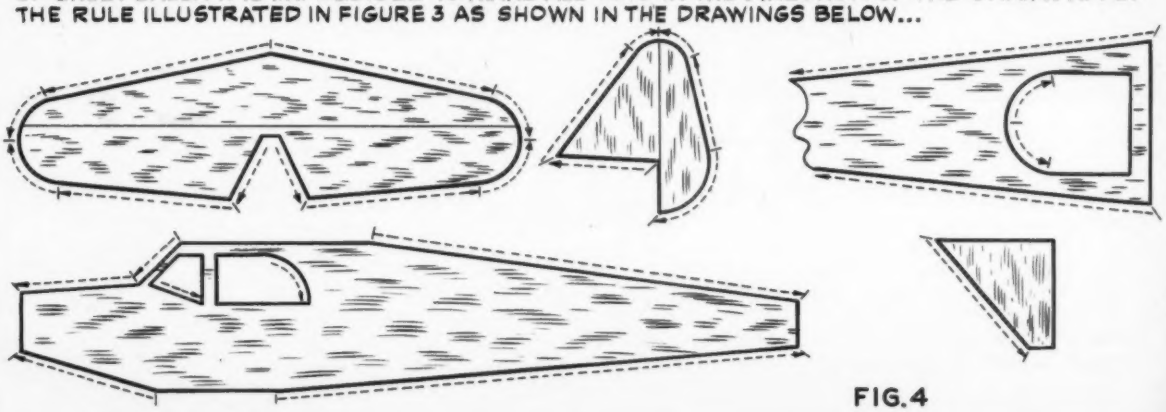


FIG.4

RAZOR BLADES ARE PROBABLY USED BY MORE MODELERS FOR MORE JOBS THAN ANY OTHER SINGLE CUTTING TOOL. LIKE ANY OTHER TOOL A RAZOR BLADE SHOULD BE PROPERLY CARED FOR. CHEAP REPLACEMENT COST MAKES IT UNNECESSARY TO BOTHER WITH RE-SHARPENING A NICKED OR DULLED EDGE. BELOW ARE A FEW IDEAS THAT WILL MAKE YOUR BLADES LAST LONGER AND DO A BETTER JOB FOR YOU...

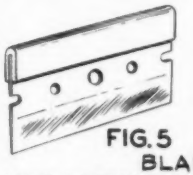


FIG. 5

A SINGLE EDGED BLADE SHOULD BE YOUR FIRST CHOICE SINCE THE METAL GUARD ON THE UPPER EDGE MAKES IT EASIER AND SAFER TO USE. RAZOR BLADES ARE MOST USEFUL FOR LIGHT CARVING JOBS AND FOR CUTTING SOFT TO MEDIUM HARD BALSA AND STRIP UP TO 1/8" THICK.

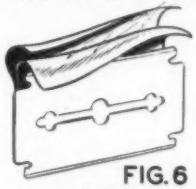


FIG. 6

IF YOU MUST USE A DOUBLE EDGED BLADE, BE SURE TO PUT SEVERAL LAYERS OF MASKING OR ADHESIVE TAPE OVER THE UPPER EDGE TO GUARD YOUR FINGERS FROM CUTS AND ADD RIGIDITY TO THE BLADE.

THROW THIS BLADE AWAY! IT'S DULL, NICKED EDGE MAKES IT IMPOSSIBLE TO MAKE A CLEAN, STRAIGHT CUT WITH IT. RAZOR BLADES ARE CHEAP AND A DULL ONE CAN BOTCH THE JOB AND COST YOU MORE THAN THE PRICE OF A NEW BLADE.

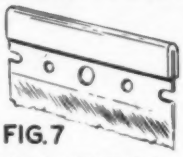


FIG. 7

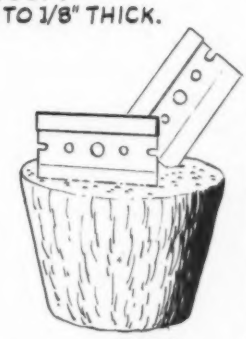


FIG. 8

LARGE CORK STOPPERS WILL PROTECT YOUR BLADES WHEN NOT IN USE. SOAK THE CORK IN LIGHT MACHINE OIL AND IMBED THE ENTIRE LENGTH OF CUTTING EDGE WHEN BLADE IS NOT TO BE USED FOR A TIME TO PROLONG IT'S USEFULLNESS. NEVER LAY A BLADE DOWN WHERE YOU CAN ACCIDENTALLY PUT YOUR HAND DOWN ON IT. WHEN THE BLADE IS NO LONGER USEFUL, DISPOSE OF IT IN A BAKING SODA CAN OR SOME SIMILAR RECEPTACLE WHICH IS KEPT HANDY FOR THIS PURPOSE.

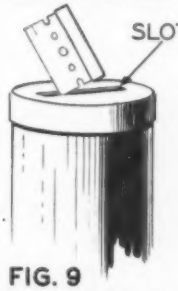


FIG. 9

RAZOR SAWS ARE AS THE NAME IMPLIES... A LARGE RAZOR WITH TEETH. THIS IS JUST THE THING FOR CUTTING HEAVY SHEET AND SMALL BLOCKS. ABOUT THIRTY TEETH PER INCH MAKE FOR SMOOTH CUTS.

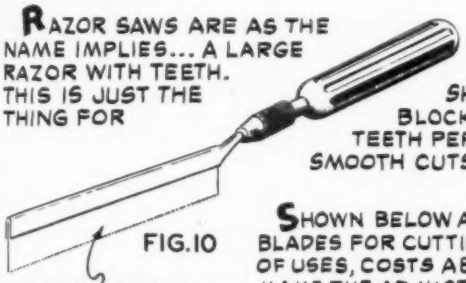


FIG. 10

SHOWN BELOW ARE TWO USEFUL INSTRUMENTS, BOTH USING RAZOR BLADES FOR CUTTING EDGES. THE RAZOR BLADE PLANE HAS A MULTITUDE OF USES, COSTS ABOUT A DOLLAR AT YOUR LOCAL HOBBY SHOP. YOU CAN MAKE THE ADJUSTABLE BALSA STRIPPER YOURSELF AS SHOWN.

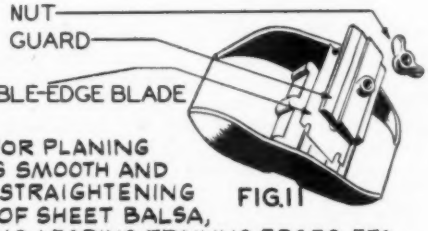


FIG. 11

IDEAL FOR PLANING BLOCKS SMOOTH AND LEVEL, STRAIGHTENING EDGES OF SHEET BALSA, BEVELING LEADING, TRAILING EDGES, ETC.

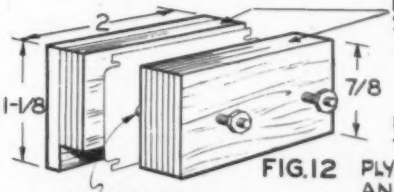


FIG. 12

BOLTS GO THROUGH ALL PLYWOOD SECTIONS AND RAZOR BLADE. ADJUST WIDTH OF STRIP BY CHANGING POSITION OF BLADE BETWEEN SECTIONS. USE AT EDGE OF BENCH OR BOARD, MAKING SURE EDGE OF BALSA SHEET IS STRAIGHT BEFORE STRIPPING. O.K. FOR 1/16" OR 1/8" SHEET. ADJUSTABLE BY SIXTEENTHS OF AN INCH.

SOME OTHER GOOD CUTTING TOOLS...

REPLACEABLE BLADE TYPE KNIVES OFFER A WIDE VARIETY OF BLADES SUITABLE FOR LIGHT TO MEDIUM HEAVY CARVING, AS WELL AS SAW BLADES, PUNCHES, GOUGES, ROUTERS, ETC.

FIG. 13

FIG. 14

UTILITY OR "SHEETROCK" KNIFE FOR CUTTING HEAVY SHEET, CARVING BLOCKS, ETC. ALL BLADES MAY BE RESHARPENED ON A STONE, ALTHOUGH LOW REPLACEMENT COST MAKES IT HARDLY WORTH WHILE.

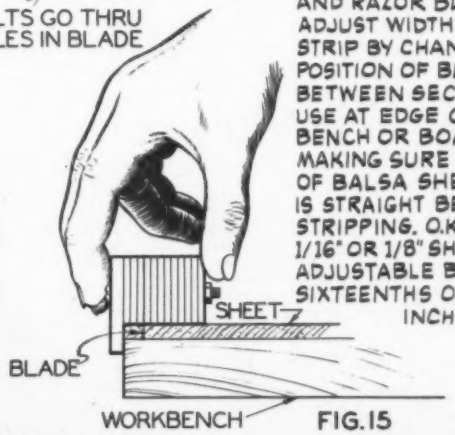


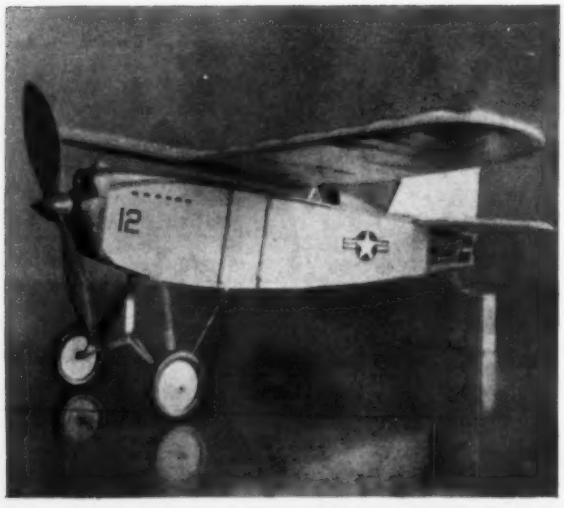
FIG. 15

AHEAD of its Time

by LORNE A. WILLIAMS

A powerful rubber motor provided skimming, fast flight. Original plans even included a simple smoke-screen device. USAF markings, insignia, a modern touch. Shines on the take-offs.

In those days props were really efficient; guys carved their own. How else? If carving is too tough, ask dealer about prop blanks.



Automatic adjustable fin—it shifts in flight to compensate for a changing torque, and shock absorbing landing gear work just fine.

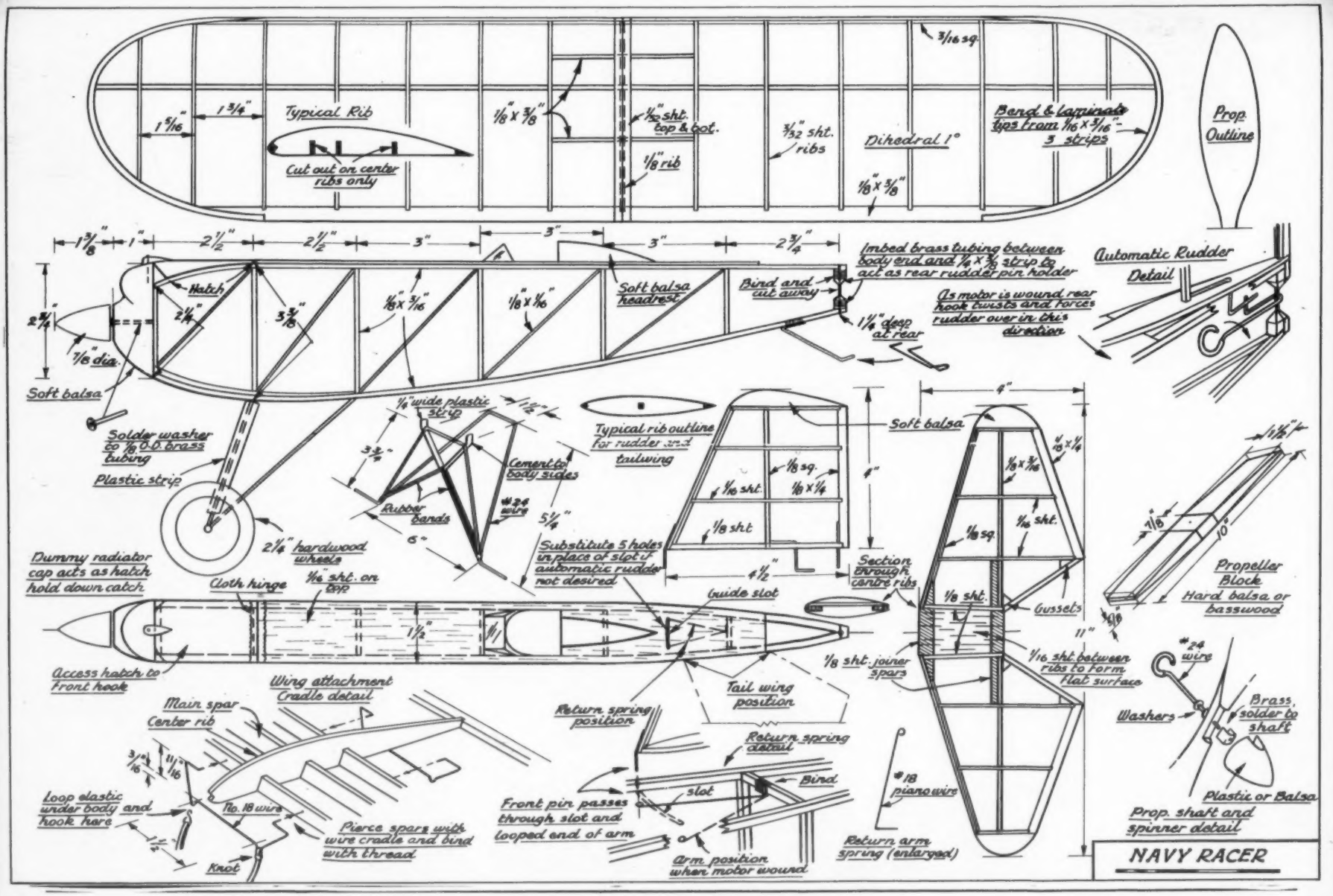
As good today as it was 28 years ago, this "Navy Racer" by R. W. McCorkle was published in the August, 1930 MAN. Dusted off by Mr. Williams, it offers a building treat.

► Twenty-eight years is quite a spell in any man's lifetime, making the difference between youth and middle-age or middle-age and grandpa. By comparison, the Navy Racer could well be called a grandpa if you happened to be building models at 40 in 1930. At least, it could be called middle-aged by the author. That was the year the Navy Racer was born, the brainchild of a youth named Bob McCorkle (hats off and bouquets to him). It appeared in Model Airplane News—then Junior Mechanix and Model Airplane News—as a featured article. Having sufficient resemblance to the then famous Curtiss Hawk series to make it interesting in appearance, it proved itself to be a most satisfying little ship to fly and undoubtedly gave much pleasure to those who appreciated it as a sport model.

It was felt that the Navy Racer, after all these years, still has plenty to offer and for this reason is presented again with minor construction changes.

To reminisce briefly, at least 20 Navy Racers were built over a period of two years. It was found just as simple to build two at one time with the thought in mind that if one was laid up for repairs another would be available for flying. Our weekend flying sprees would find us trying to get three and sometimes four in the air at one time. To prove to our local sports shop dealer (who was our only source of model supplies in those days) that something other than a twin pusher or an ROG, (rise-off-ground) could fly, a fellow builder demonstrated by letting it take off downtown on a side street off the main drag. To the dealer's surprise and the builder's delight, it flew straight down the block and landed perfectly.

The plans are relatively straight forward, but a brief review of details might be helpful: Lay out the body sides accurately on full-size plans, using 1/8 x 3/16 hard balsa throughout, cementing joints well. Cover top of body only with 1/16 soft sheet and sand down before cutting out cockpit opening. The nose block and hatch are carved from medium hard. The diagonal braces are 1/16 x 3/16 strips which add strength and prevent body twist from the wound rubber motor. Brass tubing is sandwiched between the body rear post and a (*Continued on page* 43)


Typical Rib
Cut out on center ribs only
1/8" x 3/8"
1/32" sht. top & bot.
1/8" rib
3/32" sht. ribs
Dihedral 1°
1/8" x 3/8"
3/16 sq.
Bend & Laminate tips from 1/16 x 3/16" - 3 strips
Prop. Outline
Hatch
Soft balsa headrest
Bind and cut away
1/16" deep at rear
Imbed brass tubing between body end and 1/8 x 3/8 strip to act as rear rudder pin holder
As motor is wound rear hook twists and forces rudder over in this direction
Automatic Rudder Detail
7/8 dia.
Soft balsa
Solder washer to 1/8 O.D. brass tubing
Plastic strip
2 1/4" hardwood wheels
1/4" wide plastic strip
Rubber bands
Cement to body sides
#24 wire
Typical rib outline for rudder and tailwing
Soft balsa
1/8 sq.
1/16 sht.
1/8 x 1/4
1/8 sht
Substitute 5 holes in place of slot if automatic rudder not desired
Section through centre ribs
Gussets
1/8 sht. joiner spars
1/16 sht. between ribs to form flat surface
Propeller Block
Hard balsa or basswood
Dummy radiator cap acts as hatch hold down catch
Cloth hinge
1/16" sht. on ends
Access hatch to front hook
Guide slot
Tail wing position
Return spring position
Return spring detail
Bind
Front pin passes through slot and looped end of arm
Arm position when motor wound
#18 piano wire
Return arm spring (enlarged)
Wing attachment Cradle detail
Main spar
Center rib
Loop elastic under body and hook here
No. 18 wire
Pierce spars with wire cradle and bind with thread
Knot
#24 wire
Washers
Brass, solder to shaft
Plastic or Balsa
Prop. shaft and spinner detail
NAVY RACER

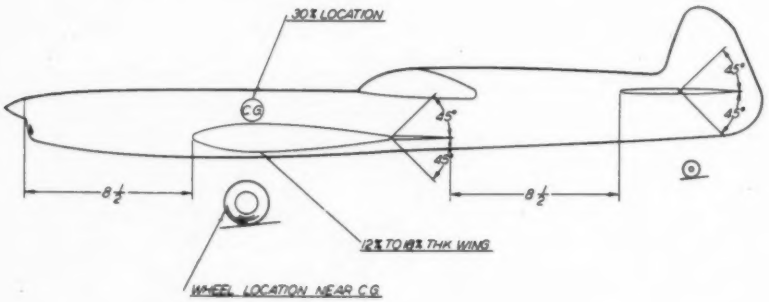
FULL SIZE PLANS AVAILABLE. SEE PAGE 60

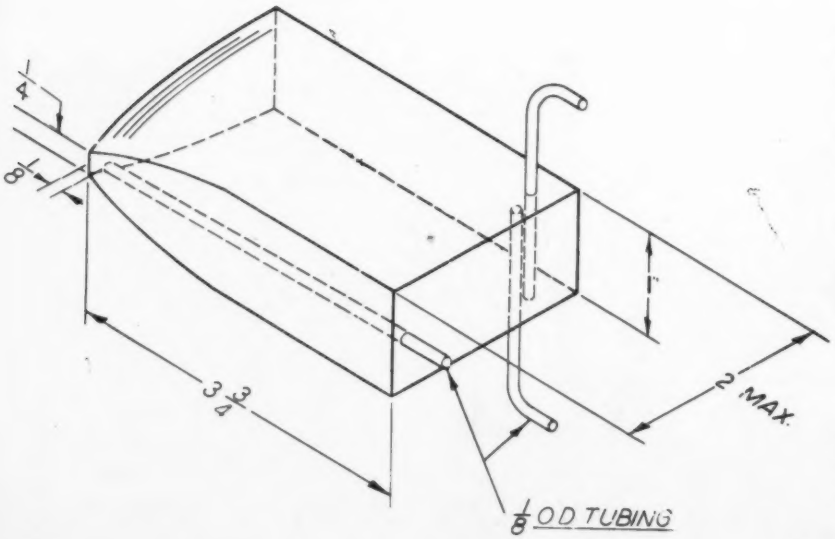
HOW TO DESIGN A STUNT MODEL

by GEORGE M. ALDRICH
NATIONAL STUNT CHAMPION

Ten years experience boiled down to ten minutes reading time. Ten years of practice and you may make George retire. But don't accuse the champion of keeping secrets.

Using "rule of thumb" principles outlined here, the author's big problem is trophy dusting. In right hand is the Nobler (June '52, MAN), the aircraft with built-in bring-home-bacon factor.





► To begin with let me say that this article is not written for aerodynamicists, engineers, or those who have gone through integral calculus, nor is it for the seasoned contest model designer.

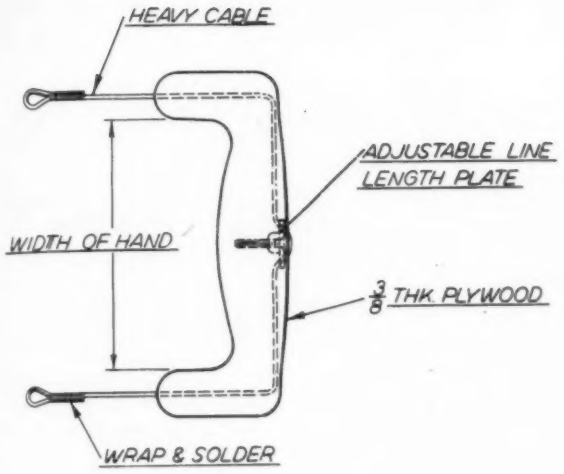
In the past few years actual building time has become more and more precious to this modeler. So, what has been written here is a practical, quick and sure method of designing a stunt model that will not just fly, but give contest winning performance every time.

The first thing one must consider is the size of model he wishes to build. It has always been this writer's opinion that a perfect stunt pattern is one that is flown smoothly and slowly. By slowly, I mean below 65 mph. Recent experiments convince me. With the .35 motor to design around, let's sit down at the old drawing board. It has been found that 525 sq. in. is about as small as you can go and still have a good slow design, with approximately 550 sq. in. being ideal.

The next thing to consider is the aspect ratio. This is found by dividing the average chord of the wing into the average span; or with difficult wing shapes, by dividing the span squared by the area.

$$\text{Written: aspect ratio} = \frac{(\text{span})^2}{\text{area}}$$

To avoid a long winded explanation, it has been found that aspect ratios of between 4.5:1 and 5.5:1 are the most efficient. For a happy medium let's settle on 5:1. With these two features decided, we can find our wing plan



The perfect pattern must be flown smoothly and slowly, Aldrich believes. For a .35 this gives a ship of just over 50 inches span.

form. Using the above formula we can substitute with simple algebra.

$$\text{aspect ratio of } 5 = \frac{X}{550}$$

$$X = (5)\ (550) \text{ or}$$

$$X = 2750$$

with $X = (\text{span})^2$

So, the square root of 2750 will give us our wing span, which is roughly 52¾ inches (52.875). Now, we simply divide our area of 550 sq. in. by our span of 52.875 and we have our average chord of 10.4 inches.

$$\frac{550}{52.875} = 10.4''$$

With this information we can use either the conventional barn-door wing with rounded tips, or we can taper our wing. The tapered wing is more efficient. Just as a suggestion, we could have a root chord of 13.4" and a tip chord of 7.4", which would give an average chord of 10.4."

We are now ready to decide on our airfoil. This being a subject of great controversy which I do not care to enter into, let me suggest an airfoil of between 12% and 18% of the average chord in thickness. A 525 sq. in. 18% layout would probably be best for extremely windy weather, although I seem to always wind up with an 18% wing no matter what the area. Airfoils should have the main thickness not more than 25% to 30% back of the leading edge. The leading edge should be half way between the very sharp and the very round configuration.

The only thing needed now to complete our wing is the flaps. Flaps which are equal in area to approximately ten to 15 percent of the total wing area have proved best. So, with our 550 sq. in. wing, somewhere between 55 and 85 sq. in. of flap area is fine. With flaps that are only 10%, making them half-span seems best.

To sum up what we have so far:

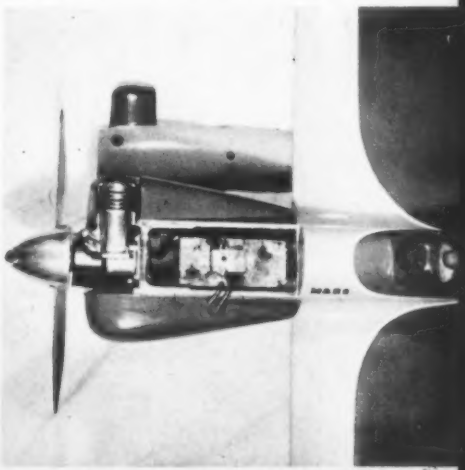
(1) Wing area = 550 sq. in. including flaps
(2) Aspect ratio = 5:1 including flaps
(3) Span = 52¾ in.
(4) Average chord = 10.4 in. including flaps
(5) Airfoil = 18% of wing chord in thickness
(6) Flaps = 15% of wing area if full span and 10% of wing area if half span.

For simplicity in laying out the fuselage dimensions, let's do away with the true definition of moment arms. As a rule of thumb, which is pretty darn accurate, the distance between the leading edge of the wing and the back of the propeller, and the trailing edge of the flaps and the leading edge of the stabilizer should be not less than 8¾ in. In direct relation to this, the center of gravity should be located between 25% and 30% back of the leading edge of the wing at the root. When balancing your model, pick it up by holding the fuselage with your thumb and forefinger at this point. Do not try to balance it at the wing tips. If, when you fly your model, it is sluggish, this is a good sign you need some weight added to the tail. If it is jumpy and unstable you need more weight in the nose.

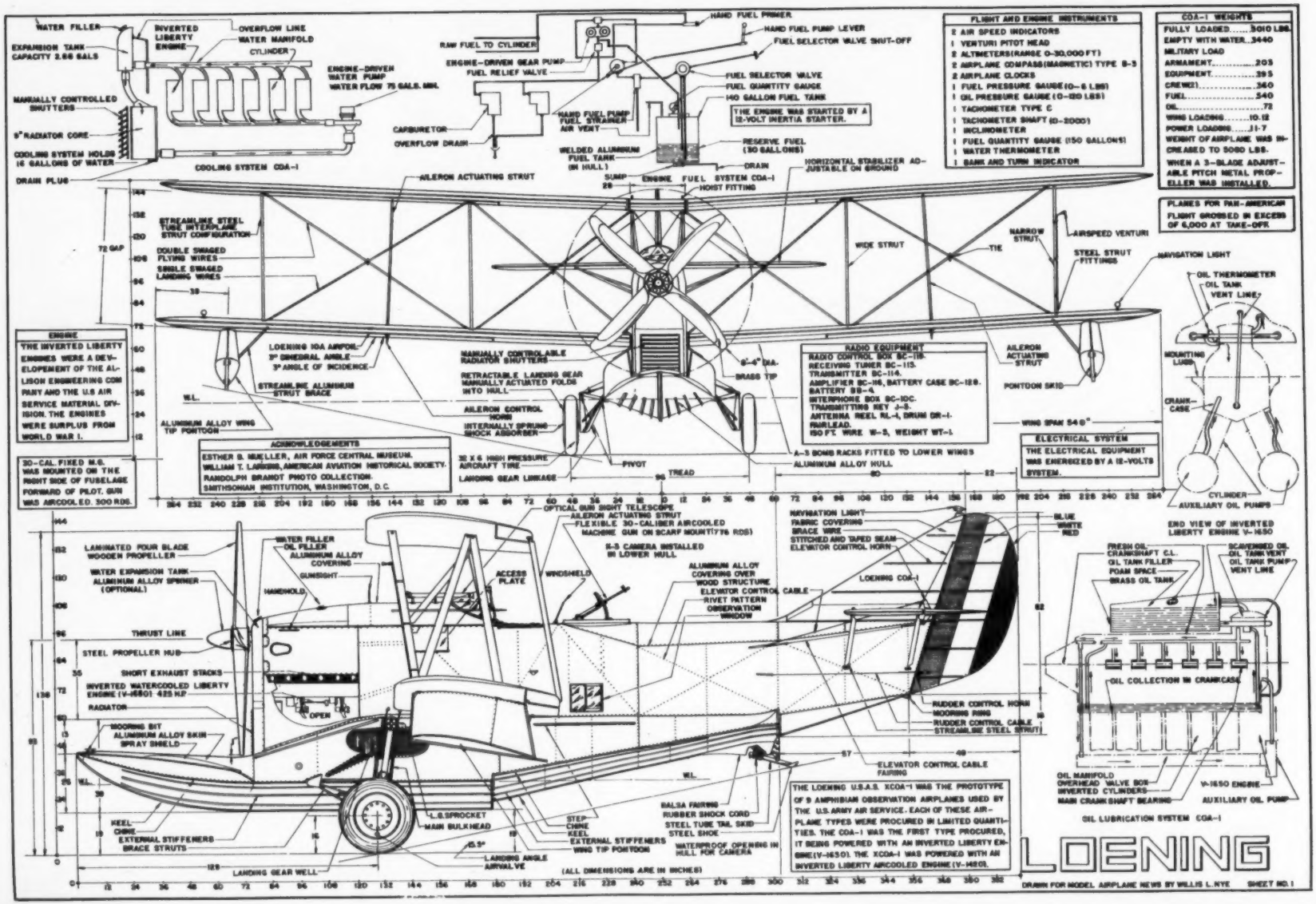
(*Continued on page* 56)

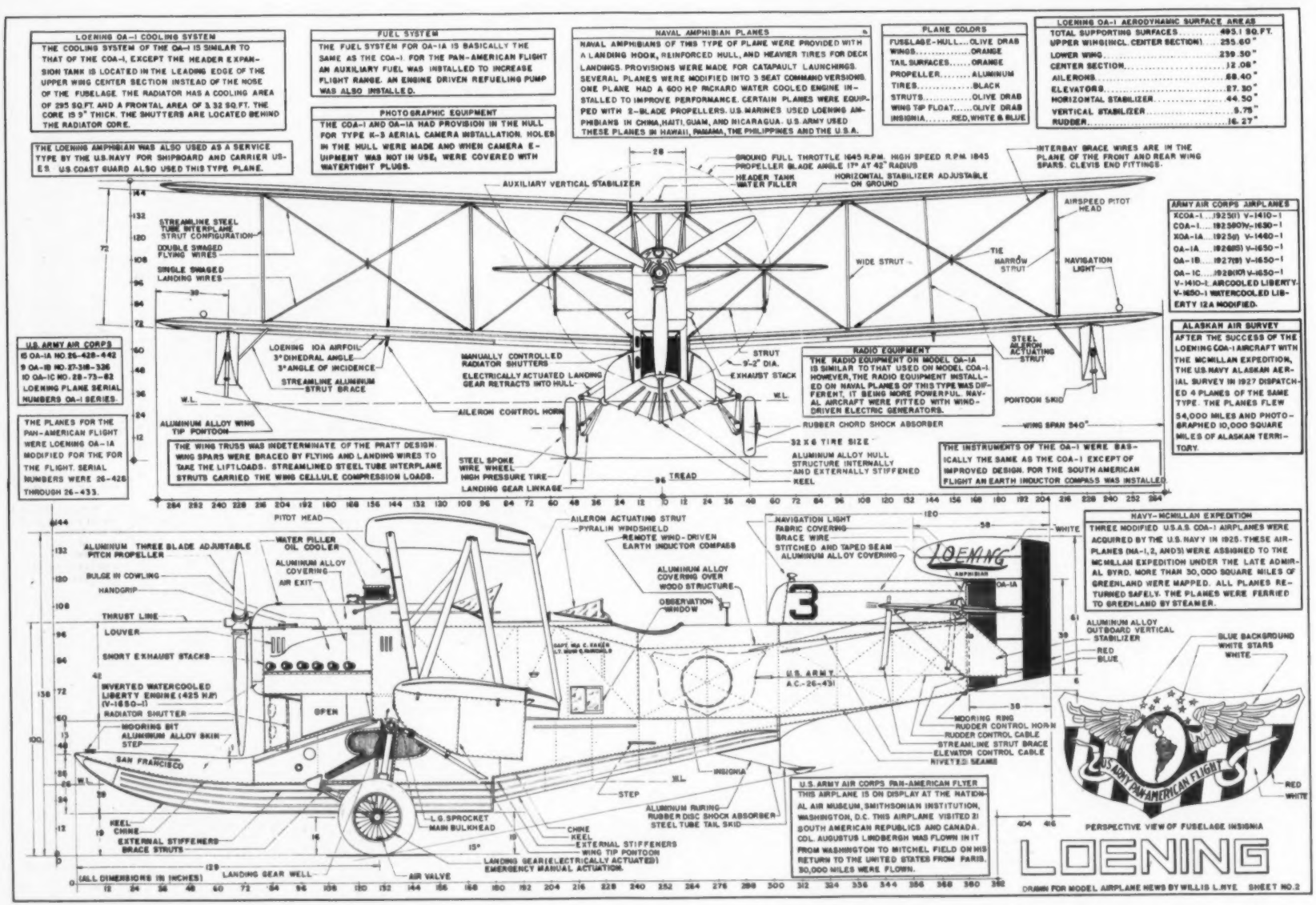
The old stunt master, Bob Palmer, right, was an influence on George's career as a Senior. Bob is cranking Mars (August '52, MAN), Bob Yount holding. Aldrich says 50 practice hops weekly.

Proper tank design and location musts for winning performance. Pic shows tank in Mars.



LOENING AMPHIBIONS by Willis L. Nye. Among the more unusual and interesting service

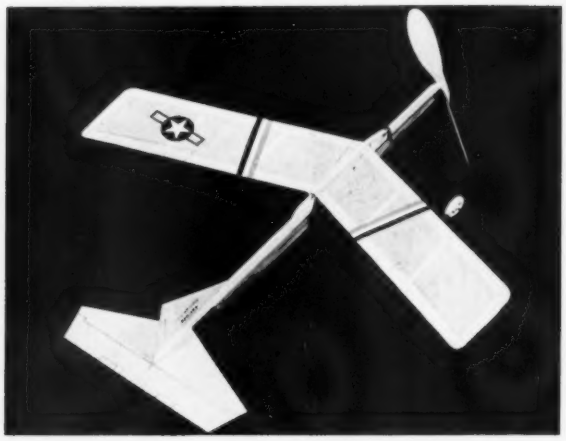



LOENING OA-1 COOLING SYSTEM
THE COOLING SYSTEM OF THE OA-1 IS SIMILAR TO THAT OF THE COA-1, EXCEPT THE HEADER EXPANSION TANK IS LOCATED IN THE LEADING EDGE OF THE UPPER WING CENTER SECTION INSTEAD OF THE NOSE OF THE FUSELAGE. THE RADIATOR HAS A COOLING AREA OF 295 SQ.FT. AND A FRONTAL AREA OF 3.32 SQ.FT. THE CORE IS 9" THICK. THE SHUTTERS ARE LOCATED BEHIND THE RADIATOR CORE.
THE LOENING AMPHIBIAN WAS ALSO USED AS A SERVICE TYPE BY THE U.S.NAVY FOR SHIPBOARD AND CARRIER USES. U.S.COAST GUARD ALSO USED THIS TYPE PLANE.
FUEL SYSTEM
THE FUEL SYSTEM FOR OA-1A IS BASICALLY THE SAME AS THE COA-1. FOR THE PAN-AMERICAN FLIGHT AN AUXILIARY FUEL WAS INSTALLED TO INCREASE FLIGHT RANGE. AN ENGINE DRIVEN REFUELING PUMP WAS ALSO INSTALLED.
PHOTOGRAPHIC EQUIPMENT
THE COA-1 AND OA-1A HAD PROVISION IN THE HULL FOR TYPE K-3 AERIAL CAMERA INSTALLATION. HOLES IN THE HULL WERE MADE AND WHEN CAMERA EQUIPMENT WAS NOT IN USE, WERE COVERED WITH WATERTIGHT PLUGS.
NAVAL AMPHIBIAN PLANES
NAVAL AMPHIBIANS OF THIS TYPE OF PLANE WERE PROVIDED WITH A LANDING HOOK, REINFORCED HULL, AND HEAVIER TIRES FOR DECK LANDINGS. PROVISIONS WERE MADE FOR CATAPAULT LAUNCHINGS. SEVERAL PLANES WERE MODIFIED INTO 3 SEAT COMMAND VERSIONS. ONE PLANE HAD A 600 H.P. PACKARD WATER COOLED ENGINE INSTALLED TO IMPROVE PERFORMANCE. CERTAIN PLANES WERE EQUIPPED WITH 2-BLADE PROPELLERS. U.S. MARINES USED LOENING AMPHIBIANS IN CHINA, HAITI, GUAM, AND NICARAGUA. U.S. ARMY USED THESE PLANES IN HAWAII, PANAMA, THE PHILIPPINES AND THE U.S.A.
PLANE COLORS
FUSELAGE-HULL....OLIVE DRAB
WINGS.....ORANGE
TAIL SURFACES.....ORANGE
PROPELLER.....ALUMINUM
TIRES.....BLACK
STRUTS.....OLIVE DRAB
WING TIP FLOAT.....OLIVE DRAB
INSIGNIA.....RED, WHITE & BLUE
LOENING OA-1 AERODYNAMIC SURFACE AREAS
TOTAL SUPPORTING SURFACES 495.1 SQ.FT.
UPPER WING(INCL. CENTER SECTION) 235.60"
LOWER WING 239.50"
CENTER SECTION 12.08"
AILERONS 58.40"
ELEVATORS 27.30"
HORIZONTAL STABILIZER 44.50"
VERTICAL STABILIZER 9.75"
RUDDER 16.27"
U.S. ARMY AIR CORPS
15 OA-1A NO.26-428-442
9 OA-1B NO.27-318-326
10 OA-1C NO.28-73-82
LOENING PLANE SERIAL NUMBERS OA-1 SERIES.
THE PLANES FOR THE PAN-AMERICAN FLIGHT WERE LOENING OA-1A MODIFIED FOR THE FOR THE FLIGHT. SERIAL NUMBERS WERE 26-428 THROUGH 26-433.
ARMY AIR CORPS AIRPLANES
XCOA-1...1925(1) V-1410-1
COA-1...1925(9)V-1650-1
XOA-1A...1925(1) V-1460-1
OA-1A...1926(5) V-1650-1
OA-1B...1927(9) V-1650-1
OA-1C...1928(10) V-1650-1
V-1410-1 AIRCOOLED LIBERTY.
V-1650-1 WATERCOOLED LIBERTY 12A MODIFIED.
ALASKAN AIR SURVEY
AFTER THE SUCCESS OF THE LOENING COA-1 AIRCRAFT WITH THE MCMILLAN EXPEDITION, THE U.S.NAVY ALASKAN AERIAL SURVEY IN 1927 DISPATCHED 4 PLANES OF THE SAME TYPE. THE PLANES FLEW 54,000 MILES AND PHOTOGRAPHED 10,000 SQUARE MILES OF ALASKAN TERRITORY.
RADIO EQUIPMENT
THE RADIO EQUIPMENT ON MODEL OA-1A IS SIMILAR TO THAT USED ON MODEL COA-1. HOWEVER, THE RADIO EQUIPMENT INSTALLED ON NAVAL PLANES OF THIS TYPE WAS DIFFERENT, IT BEING MORE POWERFUL. NAVAL AIRCRAFT WERE FITTED WITH WIND-DRIVEN ELECTRIC GENERATORS.
THE WING TRUSS WAS INDETERMINATE OF THE PRATT DESIGN. WING SPARS WERE BRACED BY FLYING AND LANDING WIRES TO TAKE THE LIFTLOADS. STREAMLINED STEEL TUBE INTERPLANE STRUTS CARRIED THE WING CELLULE COMPRESSION LOADS.
THE INSTRUMENTS OF THE OA-1 WERE BASICALLY THE SAME AS THE COA-1 EXCEPT OF IMPROVED DESIGN. FOR THE SOUTH AMERICAN FLIGHT AN EARTH INDUCTOR COMPASS WAS INSTALLED.
NAVY-MCMILLAN EXPEDITION
THREE MODIFIED U.S.A.S. COA-1 AIRPLANES WERE ACQUIRED BY THE U.S.NAVY IN 1925. THESE AIRPLANES (NA-1, 2, AND 3) WERE ASSIGNED TO THE MCMILLAN EXPEDITION UNDER THE LATE ADMIRAL BYRD. MORE THAN 30,000 SQUARE MILES OF GREENLAND WERE MAPPED. ALL PLANES RETURNED SAFELY. THE PLANES WERE FERRIED TO GREENLAND BY STEAMER.
U.S. ARMY AIR CORPS PAN-AMERICAN FLYER
THIS AIRPLANE IS ON DISPLAY AT THE NATIONAL AIR MUSEUM, SMITHSONIAN INSTITUTION, WASHINGTON, D.C. THIS AIRPLANE VISITED 21 SOUTH AMERICAN REPUBLICS AND CANADA. COL. AUGUSTUS LINDBERGH WAS FLOWN IN IT FROM WASHINGTON TO MITCHEL FIELD ON HIS RETURN TO THE UNITED STATES FROM PARIS. 30,000 MILES WERE FLOWN.
PERSPECTIVE VIEW OF FUSELAGE INSIGNIA
LOENING
DRAWN FOR MODEL AIRPLANE NEWS BY WILLIS L.NYE SHEET NO.2
(ALL DIMENSIONS IN INCHES)

Stick Time

by PAUL E. DEL GATTO

About a dozen pieces of wood go together for the "flat" wing—easily covered, by the way. While funning—get hep on building.



Sheet-balsa wing mount eliminates tricky bent-wire fittings. A light rubber band holds the wing which can be moved as needed.

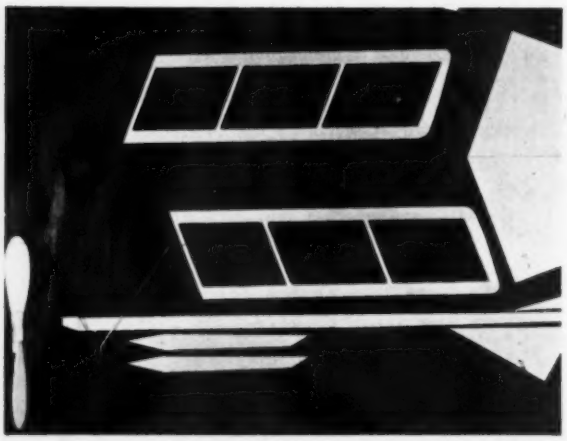
► Getting started in model building is a big hurdle to the aspiring hobbyist. It is really tough if you don't know more experienced builders who offer guidance and encouragement. If you have to go it on your own, "Stick Time" is a friend in need.

The combination of a built-up wing frame and balsa surfaces makes for easy construction with just a touch of "real building" to get you started up the ladder. And the darn thing flies to beat the band. The little things that newcomers have difficulty with have been considered. What's more, the model is easily adjusted to fly, is very stable, and looks keen. Materials required outside of a little cement and clear dope, cost less than two bits. A plastic propeller may raise it another dime.

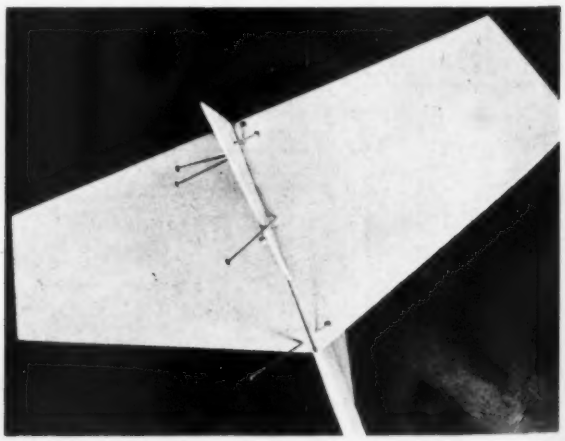
The plans are drawn full size on the next two pages. No headaches here! Just follow the drawings and closely check your building against the photographs and detail sketches to clear up confusing points.

CONSTRUCTION: Begin with the fuselage (body) stick. Select a piece of hard balsa, and cut it to the required length; taper the rear portion of the stick as shown on the plan. Hard wood such as pine, approximately ⅛" thickness, can be substituted. Cut the wing mounts to shape and cement them to each side of the fuselage stick in their proper position. This type of wing mounting eliminates the usual "V" notch or wire saddle mounting that is so troublesome for a newcomer. Besides, the mount can have a cabin outline!

The tail surfaces which include the stabilizer, fin, and bottom rudder are cut to outline shape from sheet balsa. Use smooth sandpaper to round off all the edges for better appearance and performance. Fasten the stabilizer in position by applying cement to the fuselage stick and to the center of the stabilizer where it will attach. Press these



Let's Get Started's I.N. Structor would love this—the old boy would need only his trusty balsa knife and "thin nosed" pliers.



Big deal in making any good flying model is to get the consarned thing assembled accurately. See how Paul marked the stabilizer.

By tracing, Junior made his own plan—here cuts pieces for wing ribs. Note wax paper, pins.

Full Size Plans For this Model on following Two Pages

Don't just dream about fine looking models in the pictures! Get into the act, with a real flier you can build on your own. Promote yourself—put in some Stick Time.

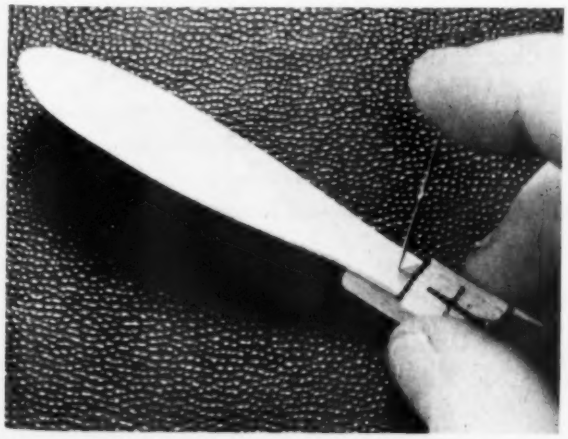
parts together and pin the stabilizer in place until the cement dries. Make sure it lines up—look at it from the front. Do the same thing with the fin and bottom rudder and line them up by eye before the cement dries.

Begin the wing construction by cutting the ¾" wide tapered (cross section) balsa stock to the desired length for the leading and trailing edges. Your hobby dealer has this tapered "trailing edge stock." From this same tapered balsa, cut pieces for the wingtips, and cement them in position. Place wax paper over the plan on your work board. Stick pins through the balsa pieces and tap the pins into the work board with a small hammer, such as a tack hammer. If the tapered balsa is not available, then use flat balsa of the same thickness (3/32") and trim it or round it off after the wing has been completed. Because the wing must have some dihedral (the panels tilt upward to make a shallow Vee), these edge strips are not to be cemented together at this time; but instead, each wing half is to be made separately at the middle and joined later.

The wing ribs are 3/32" square balsa—six are required to complete the wing. On the plan we have indicated a way of improving the wing ribs by adding another strip on top of each and sanding it to the dotted lines (top, right sketch on plan), when the wing frame has been completed.

To cut the ribs to the required length, place a strip of balsa between the leading and trailing edges, and cut one edge to the required angle. Butt this edge against the wing leading edge or trailing edge, and with your modeling knife against the other edge, mark off the position of cutting for the desired rib length. Fasten the ribs in position by putting cement on each end of the rib, and on the leading and trailing edge where the rib is to be located.

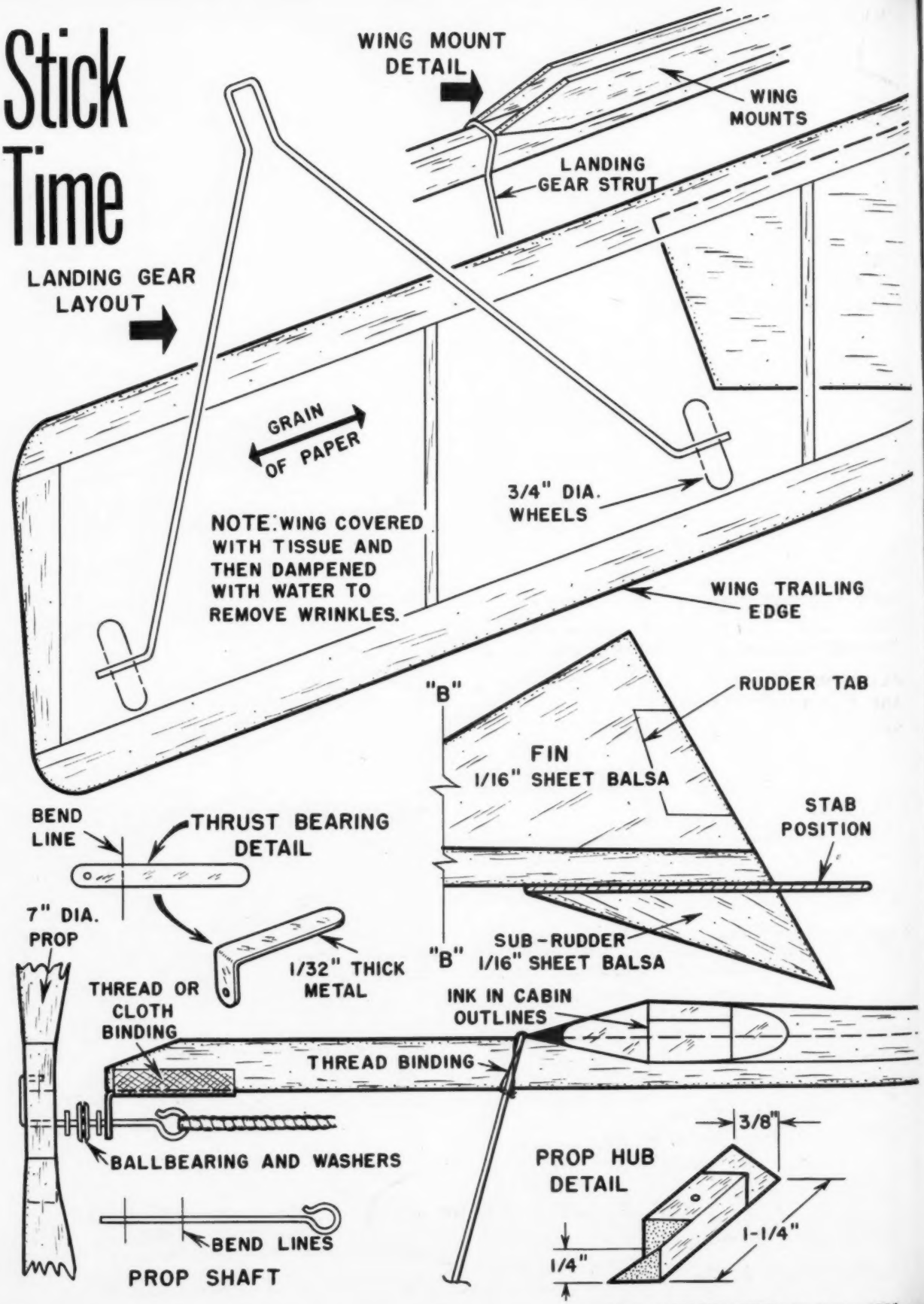
After the wing panels have been completed, join them together at the middle with dihedral. Because of the wing's generous sweepback don't be (*Continued on page* 44)

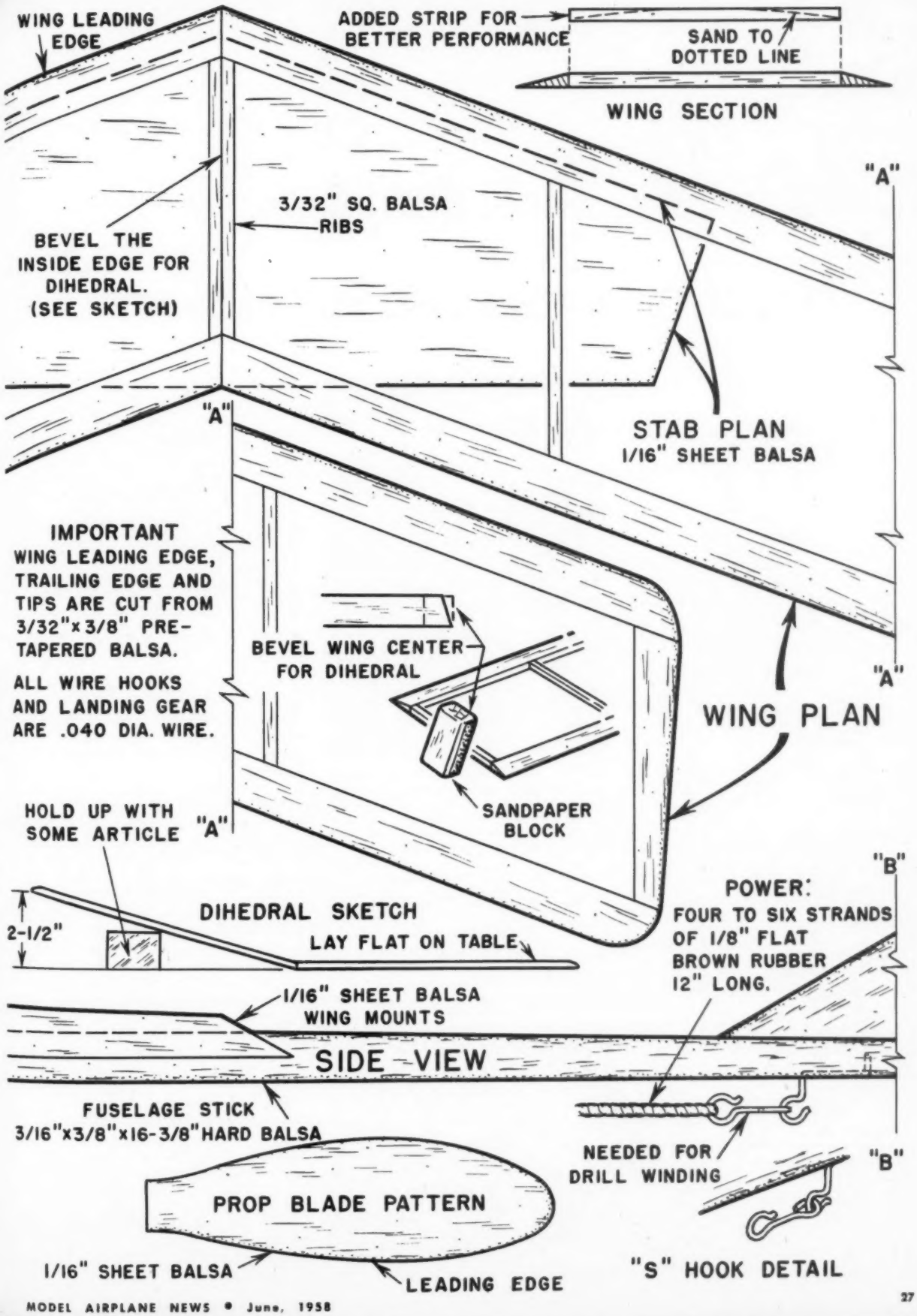


A scrap of wood for a hub and blades cut from sheet balsa and you've got yourself a prop. Blades cement to slanted hub ends.

Careful sanding makes prop seem carved. No bearing? Cement block to stick, thread wrap, bore hole for shaft, glue washer front.

Stick Time


WING MOUNT DETAIL
WING MOUNTS
LANDING GEAR STRUT
LANDING GEAR LAYOUT
GRAIN OF PAPER
3/4" DIA. WHEELS
NOTE: WING COVERED WITH TISSUE AND THEN DAMPENED WITH WATER TO REMOVE WRINKLES.
WING TRAILING EDGE
"B"
RUDDER TAB
FIN 1/16" SHEET BALSA
STAB POSITION
SUB-RUDDER 1/16" SHEET BALSA
"B"
BEND LINE
THRUST BEARING DETAIL
7" DIA. PROP
1/32" THICK METAL
THREAD OR CLOTH BINDING
INK IN CABIN OUTLINES
THREAD BINDING
BALLBEARING AND WASHERS
BEND LINES
PROP SHAFT
3/8"
PROP HUB DETAIL
1-1/4"
1/4"


WING LEADING EDGE
ADDED STRIP FOR BETTER PERFORMANCE
SAND TO DOTTED LINE
WING SECTION
3/32" SQ. BALSA RIBS
BEVEL THE INSIDE EDGE FOR DIHEDRAL. (SEE SKETCH)
"A"
STAB PLAN
1/16" SHEET BALSA
IMPORTANT
WING LEADING EDGE, TRAILING EDGE AND TIPS ARE CUT FROM 3/32"x3/8" PRE-TAPERED BALSA.
ALL WIRE HOOKS AND LANDING GEAR ARE .040 DIA. WIRE.
BEVEL WING CENTER FOR DIHEDRAL
SANDPAPER BLOCK
WING PLAN
HOLD UP WITH SOME ARTICLE
DIHEDRAL SKETCH
2-1/2"
LAY FLAT ON TABLE
"B"
POWER:
FOUR TO SIX STRANDS OF 1/8" FLAT BROWN RUBBER 12" LONG.
1/16" SHEET BALSA WING MOUNTS
SIDE VIEW
FUSELAGE STICK
3/16"x3/8"x16-3/8" HARD BALSA
NEEDED FOR DRILL WINDING
PROP BLADE PATTERN
1/16" SHEET BALSA
LEADING EDGE
"S" HOOK DETAIL

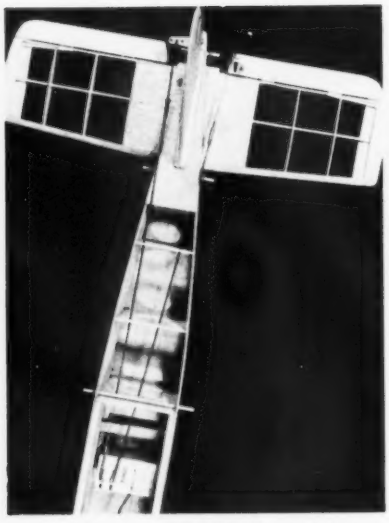
OK .09, Babcock, in Jasco Thermic with 100-in. span, built by Bob Long, put in year flying.

For beginners, experts, and guys who think they are experts, your old Button-Pusher puts a slightly terrific coverage into a high orbit.

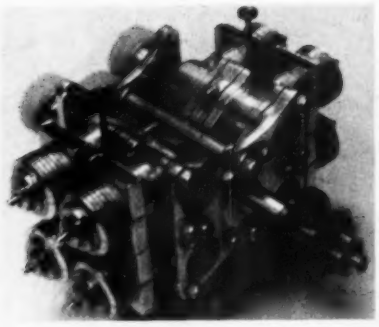
by EDWARD J. LORENZ

RADIO CONTROL NEWS

New Amtron hand-held transmitter and two-tube r'cvr enclosed in a protective plastic box.



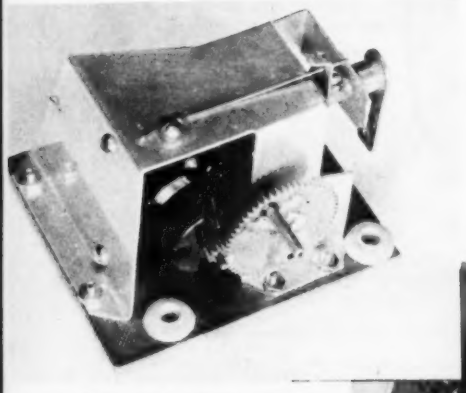
How the Temco actuator (by Temoser) is connected to rudder and elevators by pushrods.



Seeing double, double? It's 8-cylinder, by A. L. Evans, made up of 4 K & B Allyn Sky Fury .15's.

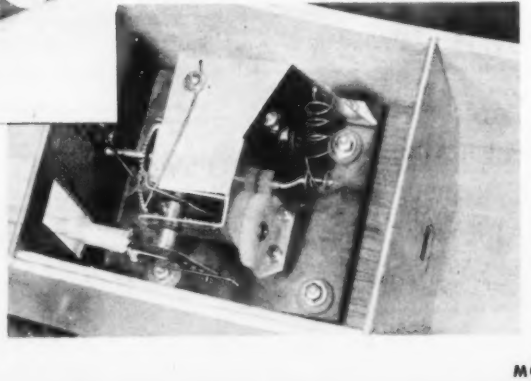
CORRECTION

Schematic, K. Day, reed modulator, page 26, April issue; drafting error omitted connection between pins 6 and 4, on V4.



Home-made actuator, Ted Strader, proportional rudder, elevator control with pulse.

Below—Strader actuator in ship. Used in "Galloping Ghost" system, elevator arm to engine.



TECHNICAL TOPICS

► With the advent of the new Raytheon CK-1054 gas tube, it was decided to design a new front-end detector and variations of the second stage, so that builders who want to "do-it-yourself" can build a reliable receiver with the minimum amount of experience. While this is not a full fledged construction article, reference to the article on the original Two-Tuber in the February, 1953 issue of MAN, will help you out. (Particular back issue out of stock—Editor). While many people look down upon gas-tube receivers, we feel they are the easiest for the average builder to construct and put into operation. They are one of the most sensitive RC receivers in use today.

The new CK-1054 has been tested and checked and found to give a minimum of 200 hours operation, when properly used. Tubes have been obtained from three widely scattered sources so that there is little chance that we obtained a "good" batch or "special" tubes. Our tests have shown these new tubes to be capable of operating up to 265 hours, continuous operation, with a pot setting required no more frequently than 20-24 hours. This type of receiver is quite popular, there being an estimated 40,000 sets in use today.

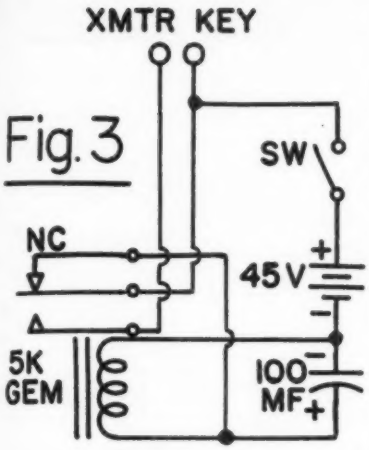


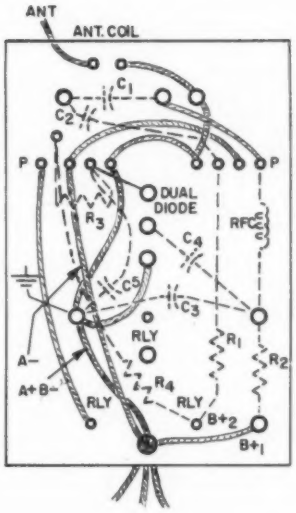
Fig. 3

The version presented here employs a tube in the second stage. Why use a tube instead of a transistor? Tubes are familiar to the average builder. They are, in most cases, more uniform than transistors and are relatively inexpensive. To sum it up, we go for transistors for certain applications and tubes for other applications. In addition, there are builders who prefer tubes to transistors. Other circuits wil be presented in future issues which employ a transistor for the second stage and which can operate a Telematic actuator directly without a relay.

Cut, layout, and drill the chassis as per the full size drawing (Fig. 1). Set the eyelets and install flea clips. All capacitors are of the tubular or disc type and all resistors are 10%, ½ watt. The RFC is the only component considered critical. While other type chokes may be used, the National unit has been found to work satisfactorily and is easily obtained. Many subminiature chokes have not given good results due to variations in the Q and capacitance. The photographs will help in laying out the components. The twin diode should be mounted as shown in the photograph, with the angled corner connected to the ground. The slug-tuned coil was obtained from Ace Radio Control and will function perfectly if wound as shown. Other coil forms may be used but will probably require more or less turns of the same or different size wire. Winding data will depend on the O.D. of the form and the type of slug core used. Wire in the filaments first and then the detector components, followed by the second stage. The antenna coil is two turns of fine plastic-covered wire, wound about 1/3 of the way from the plate end of the main tuning coil. Do not cement in place until final adjustments are made. Tuning procedure follows:

Insert a CK-1054 and a 1AG4 in their respective flea clips. Connect the filament leads to a 1½ volt battery, observing the correct polarity. Filaments should (*Continued on page* 50)

1958 LORENZ RECEIVER



CHASSIS MATERIAL IS 1/16" LINEN BASE STOCK.

HOLES – SMALL = 1/16" LARGE = 3/32" (EXCEPT WIRE CABLE HOLE IS 1/8" DIA)

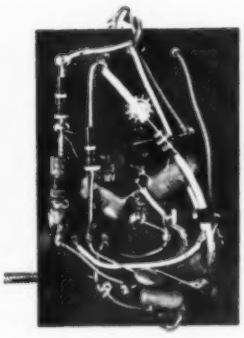
COMPONENT DESIGNATIONS CORRESPOND TO SCHEMATIC.

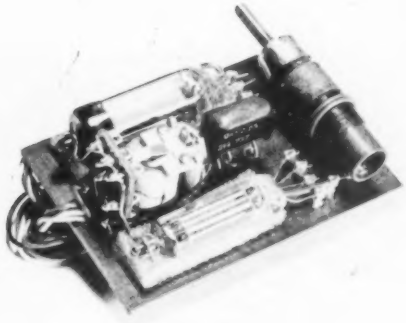
FULL SIZE

BOTTOM VIEW

USE EYELETS IN 3/32" HOLES.

Fig. 1





Compare this photograph with chassis pattern above. New "front end" with Raytheon CK-1054.

And variations on the second stage help make a reliable r'cvr requiring minimum experience.

For the past six years L's two-tuber has been one of the great basic receivers. A redesign proves you can gild the lily!

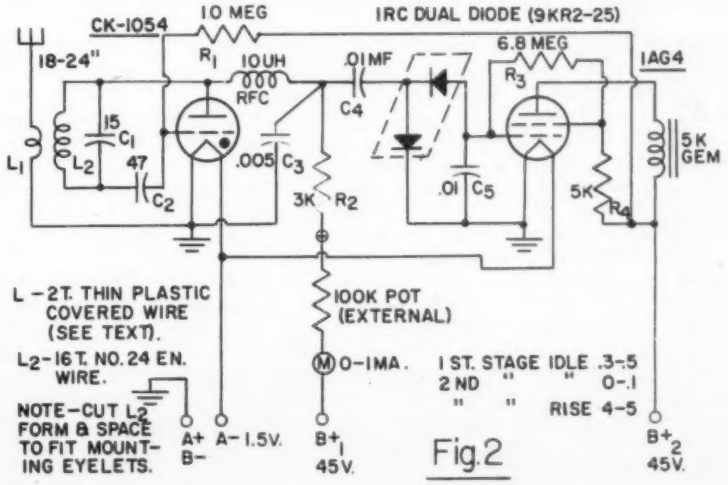
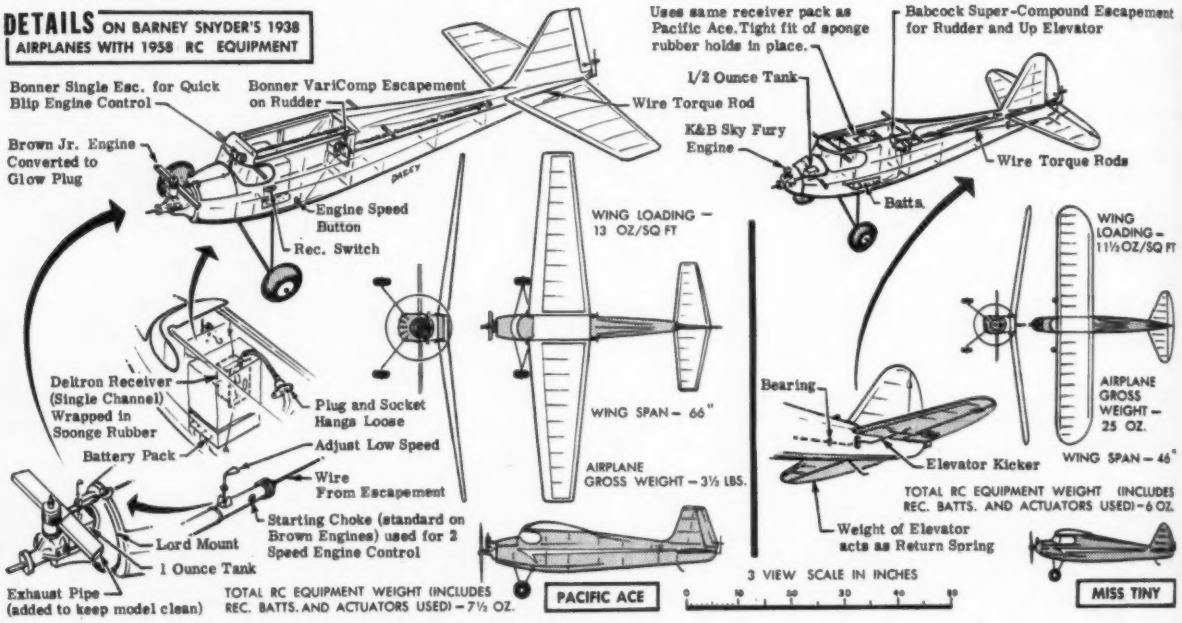


Fig. 2

RADIO CONTROL NEWS . . . Continued


DETAILS ON BARNEY SNYDER'S 1938 AIRPLANES WITH 1958 RC EQUIPMENT
Bonner Single Esc. for Quick Blip Engine Control
Bonner VariComp Escapement on Rudder
Brown Jr. Engine Converted to Glow Plug
Engine Speed Button
Rec. Switch
Deltron Receiver (Single Channel) Wrapped in Sponge Rubber
Battery Pack
Plug and Socket Hangs Loose
Adjust Low Speed Wire From Escapement
Starting Choke (standard on Brown Engines) used for 2 Speed Engine Control
Lord Mount
1 Ounce Tank
Exhaust Pipe (added to keep model clean)
TOTAL RC EQUIPMENT WEIGHT (INCLUDES REC. BATTS. AND ACTUATORS USED) – 7½ OZ.
PACIFIC ACE
WING LOADING – 13 OZ/SQ FT
WING SPAN – 66"
AIRPLANE GROSS WEIGHT – 3½ LBS.
Uses same receiver pack as Pacific Ace. Tight fit of sponge rubber holds in place.
Babcock Super-Compound Escapement for Rudder and Up Elevator
1/2 Ounce Tank
Wire Torque Rod
K&B Sky Fury Engine
Wire Torque Rods
Batts.
Bearing
Elevator Kicker
Weight of Elevator acts as Return Spring
TOTAL RC EQUIPMENT WEIGHT (INCLUDES REC. BATTS. AND ACTUATORS USED) – 6 OZ.
WING LOADING – 11½ OZ/SQ FT
AIRPLANE GROSS WEIGHT – 25 OZ.
WING SPAN – 46"
3 VIEW SCALE IN INCHES
MISS TINY

Barney Snyder out flying his rc'ed Miss Tiny, left, and Pacific Ace. Latter ship is powered by the Brown Jr. engine—come again?

1938 Planes—1958 Radio

► By Frank Dazey—Barney Snyder's airplanes (described in the sketches) should bring back pleasant memories of the "good old days" of modeling.

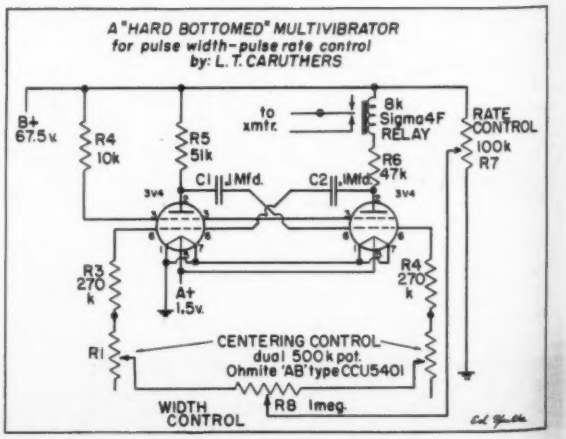
Barney's approach to RC is different in that he likes to test fly and trim out the airplanes, with the radio switched off, and then start using control in gradual stages until piloting technique gets smooth. On an early flight he crashed the Ace by using control, when a good flight would have resulted by leaving the switch off. He corrected too much for a turn, tried to smooth out the stall and misjudged, etc. Damage was minor (built-up fuselages can be durable in RC). On the next flight, Barney let the model fly itself to a high altitude before touching the button, and then practiced blipping turns until he had a smooth technique which is now safe at low altitudes.

Barney feels that one good (*Continued on page* 48)

Hardbottom Multivibrator

► By L. T. Caruthers, W40GH—The accompanying diagram shows a different type multivibrator which is virtually free of interaction. This unit is for dual proportional systems using pulse-width and pulse-rate changes for proportional control of two surfaces, usually rudder and elevator.

Interaction, sometimes called cross-talk, is the inability of the entire control system to follow the desired control surface movements. A good example of this was shown in my first effort with dual proportional using rate change for elevator control and proportion or "on-off" time for rudder control. When the elevator was moved from full down to full up with rudder position neutral, the rudder actually went from ½ right to ½ left. It was suspected that the multivibrator pulser was undesirably changing pulse width when pulse rate only was changed, and to a smaller extent changing rate when (*Continued on page* 48)



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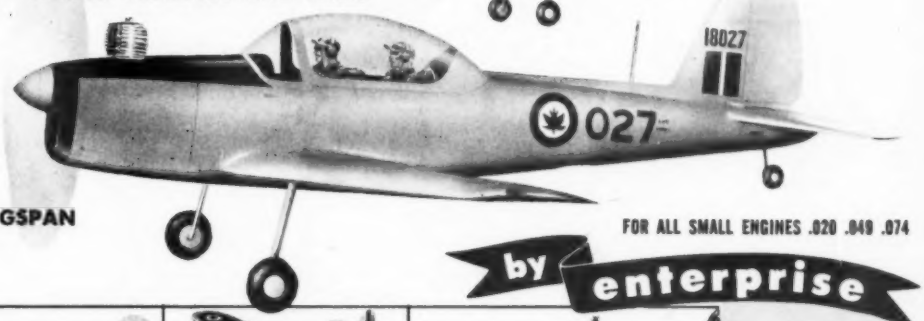

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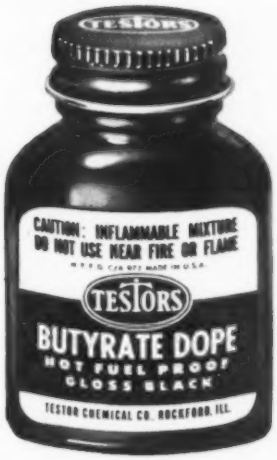

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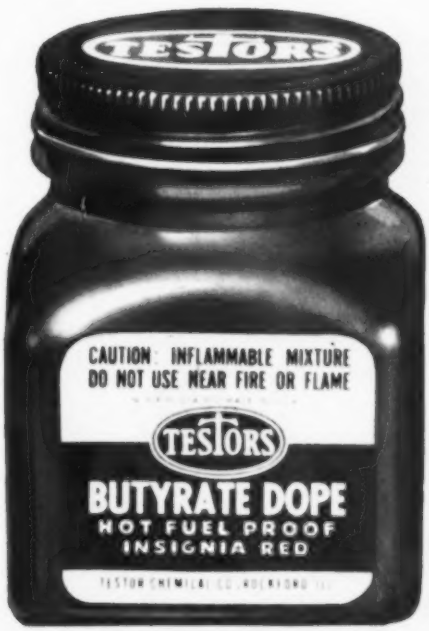

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FOREIGN NOTES

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P. G. F. CHINN

AUSTRALIA

► Unless someone succeeds in cultivating a new kind of tree, it is a safe bet that balsa will remain the world's No. 1 model airplane material, but just now the attention of Australian model builders has been attracted to a wood called King William Pine. First to use this material, some years ago, were modelers in northern Tasmania. King Billy, as they call it, grows in several parts of Tasmania and has become quite widely used in that state for longerons and spars, where extra strength is required.

King Billy, about 25 percent lighter than spruce, is nearly twice as heavy as average balsa stock used in model plane construction, but this is only half the story. King Billy is very flexible and doesn't break easily. Secondly, it is porous, like balsa, and all joints can be made with ordinary model cement, whereas most other woods need glue. Should be ideal for thin section A/2 glider wings where inadequate depth makes it difficult to provide enough strength with ordinary balsa spars.

Official results of the Australian Nationals came through too late for inclusion in last month's column. There were 22 events, ranging from HL glider to RC. Well known names were fairly prominent among the winners. Jim Fullarton won the Wakefield, with Paul Van Leuven, last year's winner, in third place, his model being proxy flown by Russ Hammond, co-editor of Australian "Model News" magazine. Basil Healy won the FAI free-flight event (new rules) using a Webra Mach-1 powered model. Bond Baker won Class 1 (.15 cu. in.) free-flight, Rick Ellis won Class 2 (.30) and George Pickers won Class 3 (.60). These three events were "power-ratio" contests, scoring by flight time divided by motor run, so hot climbs were the order of the day. Ellis used an O.S. Max-29 in a ship originally built for a .15 and a motor run of five seconds. It gave him a ratio of 16.6:1. Pickers, who had traveled 1,500 miles to compete, had a Ramrod powered by a K&B 35 and returned 12.5:1.

Team racing, which they call team-speed, is very popular in Australia. There are three classes instead of just one or two as elsewhere. Class 1 (.15) was, as usual, an Oliver Tiger benefit, with National Champion Graham Sinclair taking first place and another Oliver in second spot. Class 2 went to Barry Turner's Max-29, with a Moir-Fox 29 in second place and another Max-29 third. All three used 8/7 Tornado props, incidentally. Class 3 (.60) was won by J. Pfeifer, using an Australian Sabre .49 motor.

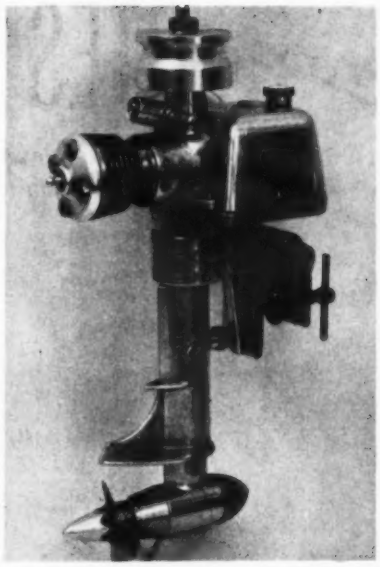
Top stunt score was by Bob Hyde, flying a Veco Thunderbird powered by an O.S. Max-35 turning a Tornado 10/6 prop. Tony Farnan was second with an Australian kit model, the Ramrod, powered by a Max-29 turning an O.S. 10/6 prop. In third place, I. Wright also used a Max-29 powered Ramrod but with Gorrie 'Mi-T' 10/6 prop. Doug Harlow won the junior stunt with a Max-35 original and Mi-T 10/6 and also went on to win the combat event from Bob Hyde.

Footnote: Unconfirmed reports suggest that earthquake felt during Nats was due to abrupt return to terra firma of R. Brown's 10-ft. FAI towliner, which arrived vertically from 300-ft.

CZECHOSLOVAKIA

Czech RC expert Jan Hajic has turned out what is one of the smallest RC models yet seen in Europe. Powered by a .03 cu. in. Diesel motor, it is comparable in size and proportions to the popular small "cabin sportster" rubber jobs we used to fly a couple of decades back. Spanning 32 in. and 19 in. long, it has a 150 sq. in. wing and weighs 12 ozs. ready to go. Of this, 7 ozs. is accounted for by the radio gear and batteries and 5 ozs. by the airframe and engine. Homemade 27 mc receiver uses one tube and five transistors.

King-sized tow-line gliders have always fascinated the British modeler. (No plans for this one!)



New .06 Italian Super Tigre outboard replaces original .049 model. A rugged clamp noteworthy.

To accommodate it in the tiny fuselage, receiver was cleverly built into a tube a little over 3/4-in wide and 6-in. long.

ITALY

With several combat fliers turning to pressure fuel systems as a means of maintaining a constant fuel supply during violent maneuvers, the Super-Tigre company is introducing a new version of their G.21/35 engine with a built-in pressurization system. This new motor has a revised crankcase with detachable front bearing housing and rear cover. The shaft is mounted in two ball bearings and case pressure is tapped from a nipple below the main bearing, shaft-valve timing being utilized to provide positive pressure. When it is not desired to make use of the pressure tank system, the nipple may be removed and the outlet sealed by a screw plug and gasket provided. The Super-Tigre G.21/35-BB is claimed to be the first combat engine to feature a ball-bearing shaft and a timed pressure system.

Super-Tigre's Half-A class Diesel G.29 has lately been replaced by an entirely new motor, the G.32 of .06 cu. in. displacement. Despite its small size, the G.32 has a twin ball-bearing mounted crankshaft and rear induction via a separate shaft valve. The Glow G.29 and G.29 Outboard are continued but with enlarged displacement (to .06) and minor improvements. Integral steel fins (in place of a screw-on alloy barrel) and a copper head gasket are now used.

SWITZERLAND

Hans Thomann, Swiss A/2 exponent, whom we have mentioned before in these pages, must now rate as one of the top half-dozen model glider experts in the world. As such, he commands our attention and, in a recent treatise, he makes out a good case for the adoption of an asymmetric wing layout as a means of improving stability while holding the model in a tight turn within a thermal. Designwise, the system simply involves increasing the span of the inner wing and ballasting the outer wing as in C/L stunt. Briefly, Thomann's theory is that this prevents early stalling of the inner wing, since both wings fly at the angle of attack corresponding to optimum lift. Therefore, the model can safely circle more tightly and

(*Continued on page* 47)

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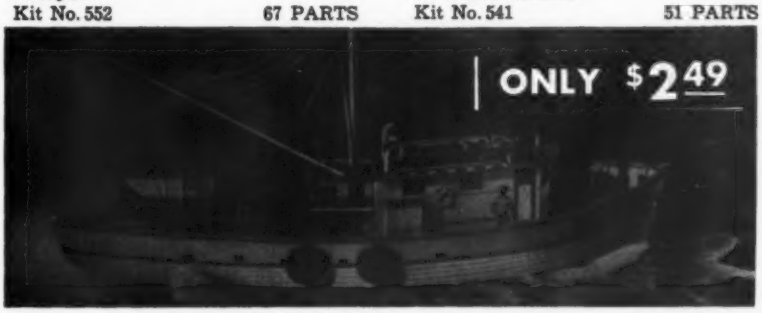

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Woody

(*Continued from page* 15)

Combat models have become pretty much standardized, with the same wing area, chord, span, wing loading, etc. When you consider these points of similarity, momentum and centrifugal force, who can make the positive statement that one type of model turns faster than another. The remaining points to be considered, then, are the moment arms and the efficiency of the control surfaces.

Proponents of the wing type of design, say that they can get a turn of smaller radius by shortening the nose- and tail-moment arms. However, in moving the elevator area closer to the pivot point, these same exponents state that the area must be increased to provide the same leverage that it did in the original location.

Now what would happen if we moved the increased area of the wing elevator back to the moment arm of the original fuselage location? If the original area were sufficient and the degree of movement remained the same, no beneficial action would be observed. Rather, a higher percentage of braking action in proportion to the leverage action would result.

There is no reason to believe that this higher ratio of braking action to plane control would decrease simply because the moment arm was moved forward. In order to turn the same sized loop as the fuselage type, more elevator area would have to be exposed with a higher braking action and a corresponding loss of speed. The tighter the turn the greater the braking action and the higher the loss of speed.

With this loss of flying speed, the larger area then becomes more effective, in proportion to the braking action, resulting in a tighter loop, requiring considerable dexterity in control by the pilot to maintain stability in the turn. Then any advantage a wing might have in a momentary change of course, would not hold in sustained maneuvering.

Most designers of combat models are influenced by stunt design. So we find flying wings using a stunt foil that is noted for its abrupt stalling tendencies. Of what benefit is sharp turning when it is accompanied by an abrupt stall? Here we have a type of design being praised for its maneuverability, when it employs a foil with inherent sharp-stalling tendencies, and an elevator area with a proportionate high braking effect that causes loss of speed and stability in turns.

In advancing the wing type of design, many advocates speak confidently of less drag than the fuselage type of design. Yet these same men proceed to use only silk on the leading edge of a model designed for high speeds. Silk, in order to be resistant to air penetration, must have many coats of dope, resulting in weight that can not be tolerated in combat design. At high speed air distorts a silk leading edge and flows through at a rate faster than it leaves the rest of the wing surface, ballooning the aft surface until the whole wing bears little resemblance to the original intended airfoil outline. If you doubt this, take up a freshly painted model some time, before it has had time to dry and take a good look when it comes down. It will cure you of silk leading edges on high speed models. In practice, the power and high speed of the modern combat motor, covers a multitude of sins or omissions in pulling many designs through maneuvers that would be impossible through model design alone.

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1. Guess how many Sterling RINGMASTER kits have been sold up to March 1, 1958.
2. Write your answer, with your name, address, and age, and the name and address of your Hobby Dealer, on the end of the box of any Sterling kit (plane or boat). Then attach the OTHER end of the same box, enclose BOTH in an envelope, and mail to Sterling Models, Contest Dept., Belfield Ave. & Wister St., Phila. 44, Pa. BOTH ends of the box *must* be enclosed (or facsimiles thereof) or your entry will be disqualified.
3. All entries must be postmarked not later than midnight, September 1, 1958.
4. Anyone is eligible to enter this contest except employees of Sterling Models, their advertising agency, and their bank. Contestants may submit as many entries as they wish, but each entry must be accompanied by two Sterling box ends (as described above) or facsimiles thereof.
5. The number of Sterling RINGMASTER kits actually sold up to March 1, 1958, has been deposited with Mr. C. C. Bosi, Jr., of the Girard Trust Corn Exchange Bank in Philadelphia. The contestant whose entry is closest to this number will win first prize, the next closest, second prize, etc. In case of tie, the earliest postmark will be given preference, so be sure to get your entry in early. Neatness is also a consideration.
6. All entries become the property of Sterling Models, and the decision of the judges is final.

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wing designs, the builders increase wing area, decrease elevator area or elevator movement, producing smoothness of movement in the model but at the expense of their cornering ability, discarding the advantages originally claimed for the wing design.

It is time to modernize the combat fuselage type! Let's shorten the moment arms as much as possible but consistent to good control and stability requirements. Move the center of lift a bit further aft of the center of gravity to induce good stability and reduce abrupt stalling tendencies during high speed maneuvers.

Since we are relying on the brute strength of our motor to help us around the turns, let's make the work a little easier by reducing the frontal area of the wing and drag by using a planked leading edge and while we are about it, streamline the section further.

If we are concerned with the high proportion of braking action to effective elevator area, then let's use an efficient elliptical outline. We also can use a better proportion control between the stab and elevator, that is stable in level flight, relieves excessive high speed stall in the stab, that detracts from the stab area and adds to the elevator area according to the demands made upon each. (See picture.)

Since weight of the fuselage is one objection to this type of design, let's reduce the weight in the aft portion of the fuselage—and beef up the portion that is so often neglected, the motor and tank mount. By making them a solid integrated unit, we get the highest rpm from the motor, and avoid the shifting, bouncing, rubber band held type of tank that induces air bubbles and an uneven fuel feed.

Let us use a profile mounted motor that maintains a steady motor run in any flight position, that is very easy to adjust to the exact amount of out thrust needed, to hold the model out at the top of the circle or in any action. This does away with the need of excess weight in the outboard tip.

Use a truss rib construction preventing warping of the wing and eliminating extra spars. The ribs will be of the tadpole or torpedo section that reduces drag as does the fixed flap type.

Finally, let us use fibre glass, if we care to, in covering the fuselage, and center section of the wing, binding the fuselage, motor mount and wing in one permanent unit on the same vibration level.

What have we got? Safe speeds of over a hundred without fast deterioration and the short life of the usual model at those speeds. Good stability in level flight and a positive control in sustained high speed maneuvers surpassing the wing models. Less fatigue to the contestant in prolonged elimination combat events. We have obtained speed, maneuverability and durability.

CONSTRUCTION

Make the fuselage first, so that the center ribs of the wing can be spaced exactly to fit the outside of the fuselage.

The center and tip ribs of the wing, together with the spars and trailing edge, form the frame for the assembling of the truss ribs. Since no leading-edge spar is used, the top plank overlaps the bottom planking of the leading edge and should be about an ⅛ in. wider. In assembling the truss ribs, be sure the spars are not forced out of line.

The back of the motor and tank mount butt against the two spars of the wing and between the center ribs. A 3/32 in. veneer is used forward of the tank on the outside

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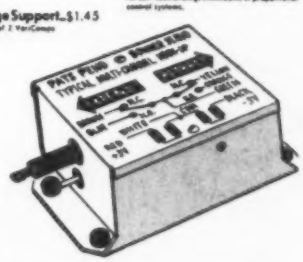

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of the motor mounts to avoid compression when the motor is tightened down.

The fibre glass is applied with the bonding agent that comes in the kit. It takes longer to set up than regular cement, but it is worth it because of the permanent fuel proof joining of the fuselage and wing. The motor-and-tank mount should be coated inside to provide fuel proofing. Note that the fibre glass is applied separately to the fuselage and wing center section. After these have set up, the wing and the fuselage are joined by the additional use of the bonding agent acting as a cement.

Because of lack of room, the bellcrank bolt will probably have to be shortened, and thinner brass washers used instead of the fiber ones. The bellcrank platform is of 1/16 in. ply, reinforced on the bottom with fibre glass. This makes it strong enough to stand any pull test and I have never had a failure in five years of using this type of platform even without the fibre glass.

The sections of the stab that are cut out to form the balancing portions of the elevator are simply cemented in place on the elevator. The cloth hinges will give ample clearance for them to pass up and down through the stab. Triangular ¼ in. braces are added to the corners of the stab and fuselage joint to add additional platform and bracing.

The wing is covered with silk. In finishing the originals, "Woody" red, yellow and black colored dopes were used. Two coats of clear dope were used, followed by two coats of base yellow and finished off with a spray-can trim of red. The nose was painted black. With a red plastic needle nosed spinner and a dyed yellow nylon prop, it makes a real colorful job.

With motor the ship should weigh in at a dry weight of around 17 ounces with a wing loading per square foot of eight ounces, or a trifle under, heavy enough to take it and furnish a platform for top motor rpm and yet light enough to maneuver with the best.

"Woody" may prove to be the fastest combat model that you have flown, and yet the ease with which it can cut into the loops of slower models will astound you. It is a total attack weapon but it will remain under control and fly exactly the type of bout that you want it to fly.

TIPS

There are several touches or refinements that will help you get the best out of your "Woody." When mounting the motor, use blind mounting nuts; these have longer threads and do not loosen readily under combat usage.

Mount the needle valve adjustment on the top side of the venturi and the fuel tubing on the bottom to avoid bent needle valves on hard landings. Add a wrap of soft wire around the tubing at the outlet of the tank and the inlet at the motor to insure against sucking air.

To find the correct needle-valve setting, always make a trial run at the location of any contest. You don't get a second chance during a contest, so be sure beforehand. If your motor runs good upstairs but loses speed on the level, the setting is too rich. If it runs good on the level but loses speed upstairs, your setting is too lean.

The tank has always retained the same setting in flight as it does on the ground for me, so the setting is simple. If you set it a notch or so rich over the top rpm on the ground, the motor picks up speed in the air, but centrifugal force takes care of the increased demand. The 2½ ounces of fuel are good for about 3½ minutes in the air, which is plenty long enough in timed combat, where almost all contests are won under three minutes. If you don't win it in this time, the other guy will, and there is no use prolonging it.

In elimination combat, it pays to have a dependable motor and a good, quick-starting technique. Know that you can start your motor with one or two flips. Take the front position on the line and when time is called, keep one eye on your opponent and the other on the timer. When your opponent's motor starts, start yours, or if the time gets too close start and take off.

You have two minutes to take off, and combat flight time starts when the second plane completes its first lap of level flight. If you take off as soon as starting time is called and your opponent delays, you are in the air seven minutes. But somehow, either in timed or elimination combat, it almost always turns out that the first three minutes of flight are the important ones. You should have your kill or cuts within this time. If it is a kill the bout is over; if a cut or cuts, you will have to refuel before the five minutes are up but remember that you are ahead on points and have a minute and a half to do what should not take more than 30 seconds, so the refueling is to your advantage.

Here in this region the pilot can come out of the center circle to restart motors. Train your helper to reload the fuel bulb immediately after the first take-off. At the end of your 3½ minutes, when you are landing the plane, he should have the battery clips attached and be refueling. By the time you reach the plane, the fuel should be in the motor by pressure on the tank—a few fast flips and you are on your

(*Continued on page* 42)

BOAT MOTORS
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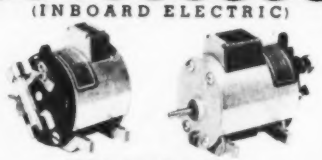

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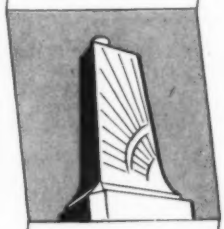

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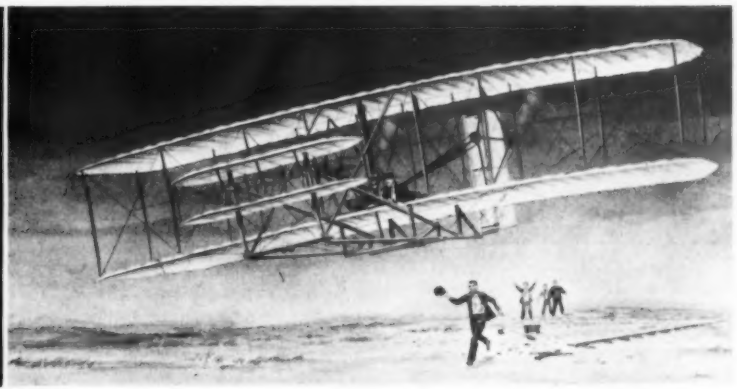

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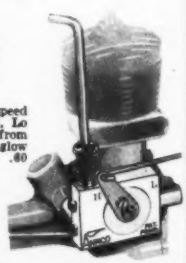

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way again. If the motor is stubborn when hot, have your helper spray what fuel is left in the bulb on the cylinder fins and head to cool it down.

So far I have had chance to use three motors, all satisfactory: the Johnson, Torp and Max 35's. You are told, when you buy a new motor that the guarantee is void if you disassemble the motor. But, I have found these things wrong on new motors: half a thimbleful of aluminum cuttings in the crankcase, mounting lugs that were unbored for mounting bolts, liners turned half way around in the case, break-in compound in the engine, holes bored out of line through cylinder fins, so that, when the head bolts were tightened down, the motor was locked. Venturi openings into the crankshaft may be obstructed. Maybe all of this has just been my bad luck, but check your new engine.

For that extra edge you have to go into the motor—if you know what you are doing. Don't try any major changes, don't try to remove too much metal. The manufacturers have taken care of all major improvements, you are simply refining or hand finishing the motor. Higher compression is an illusion that costs more than it is worth in wear and tear, plugs and hard starting. Try to work on the super charging principle. Make more fuel available to the compression chamber. You break all of the sharp corners in the path of the fuel from the venturi to the combustion chamber, smooth them and polish all surfaces that the fuel contacts. The easiest way to do this is with one of the small high speed polishing kits.

When the motor is ready, start it on a test bench using a small diameter, almost racing, prop and run the motor so that the mixture is very rich. If the motor starts to slow down add extra castor oil, so that the bearings and piston or cylinder will not scuff or score. Gradually increase the lengths of the runs until it feels like it wants to go on the regular sized prop. I have been told that the true shape of a high speed bearing is oval, and that the above procedure gives this type of a bearing, whereas, a break-in on a standard prop gives a clover leaf or rough type of bearing. Whether this is true or not, motors seem to have a higher top rpm and to last longer under the above procedure. Personally, I like to use a break-in oil that is 50-50 castor oil and the oil that goes under the various trade names of "Moly." This costs about a buck fifty at speed shops. The motors on which I have used this combination have always turned a higher rpm due to much closer fitting parts with less scoring after the break-in period. In the preliminary or testing run before a contest I always give an additional treatment.

Before each contest, and between bouts, inspect your glow plug to make sure that the glow element is not warping or sagging. If you have a high turning motor that tends to pre-ignite your mixture, or short life in plugs due simply to high rpm and extra heat, the life of the OK or Johnson type of plug can be extended, or the pre-ignition partially cured by pushing the element further down into the plug opening. The plug can be made hotter by extending the element from the opening. However, this is not generally required.

Fuel line hardens and loosens on the intake of the motor, generally resulting in a false carburetor setting which changes when the model is in the air. While the fuel line is off, blow back through the fuel tank and through the needle valve. Rewrap the fuel line ends with soft wire and bind tightly.

Thoroughly clean your model of old wax, dirt and oil with carbon tetrachloride (fumes are injurious so do in open place and don't inhale—Editor) apply a fresh coat of wax before each contest. Wax not only fills in pores and reduces drag but it keeps silk covering fresh and pliable. It helps prevent oil saturation and increase of weight. It also assists waterproofing in damp weather.

In hot weather, wrap paper around a quart fuel can to a thickness of ⅛ in. or so and tape it on. Keep your flying fuel in this. Wrap the thing in a plastic bag to contain odors and stick it in the refrigerator a day or so before the meet. Comes time for the contest, put ice in a container, take it to the field and keep your fuel on the ice. The reason for the quart can? The larger sized can of fuel stays cold longer than a smaller size. The cold fuel gives more power, helps to prevent preignition and over heating. It restarts hot motors more quickly. You might have to stand for some kidding at first, and some of the fellows will tell you that you are doing more harm than good, but before the hot day is over some of the other fellows will be asking permission to keep their fuel on your ice.

The second instance of voiding your motor guarantee is when you get mud, dirt or sand in your motor. By all means take the motor apart and clean it thoroughly. You are never sure of flushing all sand or dirt from a motor and a half dozen grains of sand in the wrong place can really raise hob. Make sure that you have a spare set of gaskets and screws on hand.

A good trick after flying any bout is to add a squirt of Three-in-One oil or any good penetrating oil to your motor and turn it over several times to work the oil in. Use a plastic bag, such as vegetables come in, to enclose the motor and fuel tank. This offers better protection than the usual wrapping with cloth.

A spinner is recommended but, if you do use a spinner, be careful of the size; 1½ in. is as large as you should go. Any larger and you cut down the meat on a prop and restrict the venturi. A spinner also helps to keep the ribbon from wrapping around your prop and venturi and choking the motor down.

One of the new nylon props is highly recommended for combat and rat racing. The nylon prop can save you valuable time, preventing prop changing especially if you use a spinner.

Combat is only a game, but it is worth playing with everything that you've got. If you have to lose, make sure that it is really to a better man, that you are not beating yourself.

Ahead of Its Time

(*Continued from page* 18)

piece of ¼ x ⅜ strip to receive rear rudder pin. Cut away as shown on plan to expose tubing which forms an anchor point for rear motor hook. The stabilizer has two joiner spars which permit the forming of a flat recessed platform between the two center ribs when covered on top side with 1/16 sheet. This platform enables the rudder to move freely from side to side between the two center ribs, and allows the tail wing to set down over the body with the two center ribs fitting snugly up against the body sides when in proper location. The front rudder pin fits through slot cut in top body sheeting and passes through return spring loop underneath. The operation of the automatic rudder is such that when the motor is

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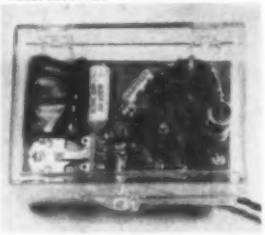
The single channel offers these advantages: Light weight, HiFi--since audio frequency used is 5400 cps; much higher than any comparable AF receiver and thus much less susceptible to interference!



MarcyTone Receiver is housed in plastic case measuring 2 x 2 7/8 x 1 inches, only 3 ounces, has low filament drain--only 13 ma. Relay current rise on receipt of 85 to 100% modulated signal from 100 microamps to over 4 ma for positive relay action with only 30 volts of B! And the price for the exclusive Ace kit is only slightly more than tube audio receivers. Kit is complete with wound coils, 6007 tube, fabulous new Philco T0037 audio transistors, Gem relay, all capacitors and resistors and punched base. A truly fabulous receiver at a low price of only $17.95

MarcyTone VFO Transmitter for single channel is also available for delivery. Features a multi vibrator oscillator in a tunable audio circuit to accurately pin point the AF frequency for best performance of the receiver. Different filter networks may also be purchased for the single MarcyTone receiver, and transmitter may be matched to all of them. Audio is variable from 1000 cps to 6000 cps. Modulation is 100%. MarcyTone VFO is housed in metal case 3 x 5½ x 8 for compact but powerful hand held unit. Uses two 467 and one 742 or equivalent for long life. MC250 power supply may also be used for greater economy. Unit is MOPA type of crystal controlled transmitter. Comes with punched silk screened cabinet, tubes, crystal, all components, except 3 foot section music wire for antenna and batteries. Only $18.95

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wound the rear hook twists, pressing against the wire stem at rudder center and pushing it to the left (from rear) to counteract torque. As the motor unwinds, the return spring brings it back to center or extreme right position as desired, depending on the amount of angle bent in return spring. If automatic rudder is not wanted, simply substitute three to five small holes in place of slot which will give variable positions for rudder trim. A snug fit into holes can be had by bending front rudder pin slightly backward.

Cut out and assemble wing ribs to main and cradle spars, cracking the spars to form dihedral. Coat cracks well with cement. Laminated wing tips are made by soaking three 1/16 x 3/16 strips of adequate length in warm water for each tip. Bend to shape over the plan and hold them in place with pins. When dry, remove and cement together and replace in jig until cement dries. Assemble to wing and trim to match leading and trailing edges.

The propeller is carved from a hard balsa or basswood block. The latter will stand up indefinitely and adds only slight increase to over-all weight. (See hobby shop for rubber model props or prop "blanks.")

Choose a good grade of covering material that will stand up to constant handling. Thin out first two coats of dope, half and half, and complete with your favorite color scheme. The original model had aluminum body, orange wing and tail assembly, red band around the body behind the cockpit, with the word "NAVY" on both sides of the rear part of the body. "Stars" of the period and vertical red, white and blue rudder stripes, and painted exhaust ports completed the decoration.

Twelve strands of 3/16 flat stretched out to wind about 80 turns with a four-to-one winder will get her up there. Move wing forward to backward to balance at a point one-third back from the leading edge of the wing.

A feature not included in this plan was an engine noise similator, consisting of a clock gear soldered to the prop shaft which engaged a plastic strip to make it vibrate against the body covering to create a buzzing sound.

Don't expect to break records, as it probably won't catch a thermal. It was designed solely for pleasure—what more can you ask.

Stick Time

(*Continued from page 25*)

upset if you should have trouble in getting the amount of dihedral shown on the plan. As long as you come within ¼" of the required amount, the model will fly ok. Since the panels are butted together, it is a good idea to bevel the edges to be joined to form a "V" for the dihedral. This can be done with a sandpaper block or even with a modeling knife, cutting away at an angle some of the top edge of the two ribs that will butt together. The detailed sketch clarifies this point. When the panels are ready to be joined, lay one panel flat on your working surface or table and prop up the other side with a block of wood or bottle. Apply cement to the joining edges and press them firmly together. Allow to dry before removing.

Covering discourages many a beginnner, but with a little patience and care this hurdle is quickly overcome. The task is simple on this model because we are covering only the top of the wing.

Cut two pieces of tissue paper for each wing panel allowing ¾" all around for trimming. Mix some cement (one part cement two dope) with clear dope to attain an adhesive that can be applied smoothly with a brush to form a good bond. Apply this adhesive to the leading edge, trailing edge, center rib, and wingtip for one panel. Then quickly place the tissue over it with the shiny side up and with the grain of the paper running the length of the wing. With the thumb and forefinger of each hand, press the paper to the wood, pulling it taut to remove as many wrinkles as possible. When all edges have been secured, trim off the excess paper. Repeat this same procedure for the other wing panel. With a small flit spray or atomizer containing water, dampen the surfaces lightly to tighten the paper further and remove the remaining wrinkles. Spray one panel at a time, place flat on bench with a small weight to hold flat until dry.

For a model this size there are plastic propellers available at the hobby shop (ask for rubber props) which serve nicely. For anyone interested in gaining experience in propeller construction, the simplified approach we have used by-passes the major headaches of carving a prop from a block. There is no carving to do as the blades are cut to outline shape from 1/16" sheet balsa, using the pattern on the plan. To further simplify the assembly, the hub ends are

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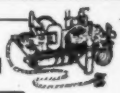

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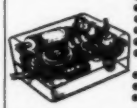

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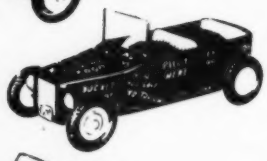

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beveled as shown and the blades are cemented to each side of the hub. When the blades are thoroughly dried in position on the hub, the hub and blades are then trimmed to remove some of the waste wood; the blades also are curved slightly (like a wing cross section) into an airfoil shape by working them with the fingers and breathing on the blade surfaces (while binding) to make them even more pliable. Do not use hard sheet balsa for your blades as putting slight curvature in them becomes difficult. Select wood that bends easily.

Bend all the wire hooks and the landing gear strut to shape from .040" diameter music wire.

The thrust bearing can be made from any piece of metal of approximately 1/32" thickness. Fasten the thrust bearing to the nose with thread or cloth binding and coat with cement. The landing gear strut is cemented and bound to the fuselage stick as shown on the plan.

Cement the rear wire hook in position and then insert the prop shaft through the thrust bearing, also inserting washers as shown, and then pass the shaft through the propeller. Bend over the end of the shaft and push it into the propeller hub as indicated. Apply a coat of cement over this area.

The "S" hook is required if you would like to wind the model with the aid of a hand drill which has a wire hook placed in the chuck. This permits removing the motor from the rear hook and stretching it three to four times its normal length while winding, thus doubling its turn capacity.

For best results, the rubber motor should be lubricated when not in use and cleaned and stored away in a dry, cool place in some sort of container. For a lubricant, castor oil will do in a pinch, but a better lubricant consists of two parts glycerine and one part tincture of green soap. These items can be obtained at the drug store.

If you would like to put on some sort of dope finish to better preserve the model's structure, brush on one coat of thinned clear dope over the entire structure. Two coats can be applied to all the wood parts but more than one coat on the tissue covering is not advisable as it would be difficult to keep the wing from warping. Lightly sand the model with very fine sandpaper to obtain a smooth texture on the surfaces after doping. If the paper is doped, dope one panel at a time and hold true in the hands while it dries.

FLYING: Fasten the wing to the fuselage with small rubber bands. This permits sliding the wing forward or back until all the adjustments necessary have been made. The model should balance approximately at the wing trailing edge at the center. If it does not, move the wing for-

BILL OF MATERIALS

1—1/16" x 3" x 18" (med.) .....Stabilizer, fin, sub-rudder, propeller blades, and wing mounts.
2—3/32" x ¾" x 36" (med.) .....Wing leading edge, trailing edge, and wing tips.
1—3/32" x 3/32" x 18" (med.) .....Wing ribs.
1—3/16" x ¾" x 18" (hard) .....Fuselage stick.
.040" dia. wire for strut and hooks, thread or cloth for binding, balsa hub for prop, washers, 6 ft. of ⅛" flat rubber, cement, clear dope, sandpaper, tissue paper covering, thrust bearing.

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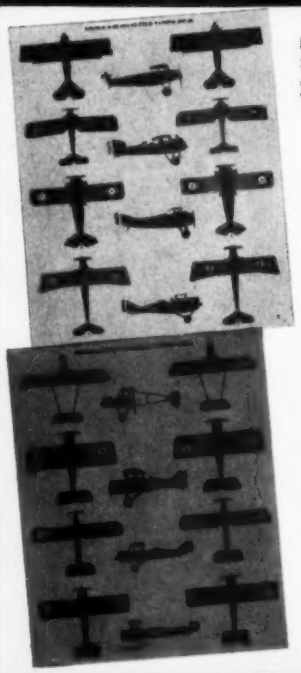

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ward or back, whichever is required.

Test glide the model by launching (easy does it!) from shoulder height with a gentle follow-through of the arm. If the model has a tendency to nose down, then move the wing slightly forward. Continue checking until a normal glide is obtained. Should your model stall, shift the wing rearward until the normal glide is obtained.

Begin flight testing by winding the model 40 to 50 turns by hand. This should be enough to indicate its climbing and turn characteristics. If the model tends to stall in the climb, bend the rear of the stabilizer slightly down and reset the wing (forward) to compensate for this added lift in the tail. Other methods of eliminating the stall in the climb are to increase the turn (bend the rudder tab) should it be only a slight stall; or to bend the thrust bearing so that the propeller is tilted downward slightly. This is called "down thrust." Similarly, if we should encounter a dive under power, we can eliminate it by bending the stabilizer rear edge up slightly, eliminating turn (with rudder tab) if it is too tight, or tilting the propeller up slightly by bending the thrust bearing.

Continue adding turns with each successive flight until the model is flying properly, then lightly cement the wing in place and remove the wing hold-down rubber bands.

Foreign Notes

(*Continued from page 34*)

stay within the confines of a thermal bubble—an important attribute in World Championship class contests where, nowadays, standard procedure is to feel out thermals while towing.

Thomann's latest A/2 model to utilize this system is equally interesting. Adhering to the short nose, toothpick fuselage, high aspect-ratio wing configuration developed in Europe, it has a span of 80 in. and a length of 47 in. To reduce polar moments of inertia, only five in. of this length is in front of the wing and the weight of the tail end is kept to a minimum by the use of a sheet balsa tubular tail boom and extremely light tail structure. The horizontal stabilizer—only about 70 sq. in. area, or 15%, and of thin, undercambered section, has 1/32 in. ribs, a narrow 1/16 sheet trailing edge and weighs only 1/4 oz. The wing uses tip dihedral, a 1/32 in. dia. nylon turbulator and a thin, highly undercambered section. A spruce mainspar is employed. The center of gravity is at approximately 64%. No wing rubbers are used, attachment being via a spring-loaded screw head in the fuselage engaging a slot in a dural plate in the bottom of the wing.

IN BRIEF. . . .

England . . . For big boat fans, Ripmax Marine Accessories of London announce the Gannet 15 c.c. (.90 cu. in.) gas motor. This is a four-cycle, overhead valve engine, with water cooling and throttle equipped carburetor. Runs on straight gasoline with separate lubrication system. Price? Around $70.00.

South Africa . . . From WIPMAC, excellent bulletin of the progressive Western Province club: a report that Don Macdonald did 14 turn spin with his Smog Hog—and from site 6000 ft. sea level . . . A record?

East Germany . . . A pulse-jet engines coleopter has been produced by a modeler called Hans Frank. Motor is East German made Victoria MD-1. Report did not say whether it works . . .

Cuba . . . Hobby shop ad from Havana lists all latest sensacional U.S. motores, including, we note, el nuevo McCoy 29.

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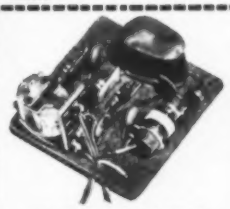

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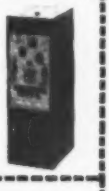

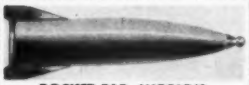

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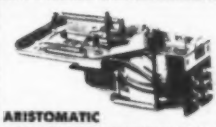

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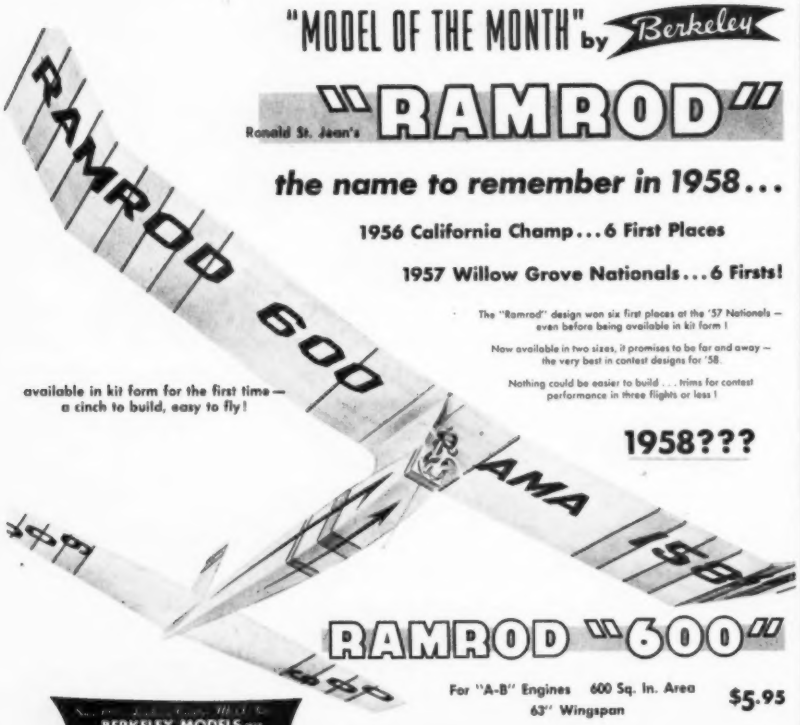

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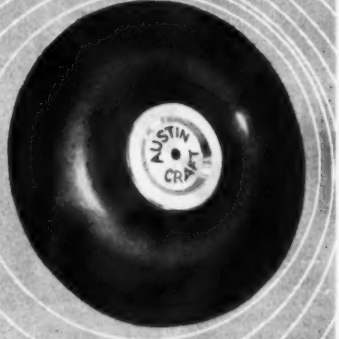

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JAICO PRODUCTS

1938 Planes

(*Continued from page* 30)

way to start RC is to go ahead and build an airplane and get it flying well in FF, and then install RC in it. Besides allowing the new-start to concentrate on one thing at a time, and avoid confusion, this also spreads the money outlay over a longer period of time.

Barney at one time had one of the world's largest model companies, until a fire swept the plant in 1945. In the 30's and 40's, the Miss Tiny and Pacific Ace were very popular free-flight gas models. Barney is also remembered for his widely used rubber models, especially the 30" Pacific Ace. Exact figures went up in the fire but over two million were sold, which shows what's possible with a "right" airplane and ample advertising.

After the fire, Barney got closer to the public by building up a bustling hobby shop business. Now Barney's starting to make kits again. His past results in manufacturing, coupled with getting to know the wants of the modelers who come into the shop will certainly be an asset here.

About design, Barney feels that 80% of all new models, and light full-sized airplanes are laid out similarly to the Pacific Ace and Miss Tiny, and the aerodynamic principles established in the 30's will be valid for years to come. The latest versions of Aeroncas, Piper Cubs, etc., are little changed basically from the products of the 30's. RC doubtless will help interest in modeling grow, but here too, the aerodynamic layouts developed in the 30's will be very popular in the years to come.

Multivibrator

(*Continued from page* 30)

only proportion was changed.

After building several multivibrators and experiencing interaction of rate and proportion, thus producing rudder and elevator interaction, it was decided that the best place to start getting rid of this effect was with the transmitted signal. All other attempts to reduce rudder and elevator interaction had failed. The Hard-Bottomed multivibrator was the final solution, and it will give reliable results with no detectable interaction.

Hard-Bottoming is explained in C. C. Harris' article *The "Hard-Bottoming" Technique in Nuclear Instrumentation Circuit Design* (IRE Transactions of the Professional Group on Nuclear Science, Vol. NS-3, no. 2, March 1956). Hard Bottoming in this multivibrator means that enough screen current has been used so that the plate current (and also the plate voltage swing) does not vary greatly as the control grid current is changed by moving the rate control. The result is that there is no interaction between rate change and proportion.

The mechanical methods of changing the proportion control and rate control potentiometer will not be discussed. Several very good methods have been devised for control stick type operation of these two controls and appear in past model publications. Standard component values are used throughout and values of potentiometers and resistors where possible were chosen from previous multivibrators so that a minimum of new parts would have to be bought. The variable resistors should be linear taper types. Resistors R_1 and R_2 are a dual 500 K unit connected so that one section increases in resistance as the other section decreases. Other dual units may be used here or re-

(*Continued on page* 50)

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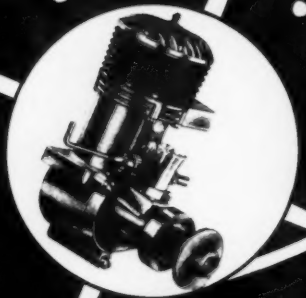

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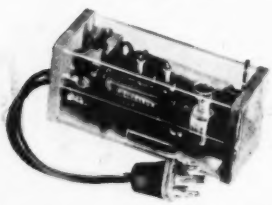

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sistors of 270 K used if it is desired to omit the centering control.

A pair of 3V4's, 3S4's, or 3Q4's will work equally well in this circuit. Three units were wired for test purposes; the first two workbench layouts were with some very old 3S4's and the third used new 3V4's. No detectable changes in characteristics were noted.

In order to take advantage of the lack of interaction in the Hard-Bottomed multivibrator, it is necessary to keep the plate current low. However, this is not a problem since the above circuit will produce a relay current from zero to 1.3 ma which is more than enough current for very reliable operation of a Sigma 4F (8,000 or 10,000 ohm) relay.

Resistors R_3 and R_4 are added to reduce the pulse rate and also to reduce sensitivity of the proportion control. Condensors C_1 and C_2 may be increased in value to decrease pulse rate and smaller capacitors here will give a faster pulse rate. It was found that the above circuit values produced a pulse rate from about 2 cps to 10 cps which was adequate for the type of dual installation in use. The plate current was found to be 1.3 ma when "on," and zero when "off" with only 1.2 volts on the filaments (wet cell supply in almost discharged state). The B plus voltage may be raised to around 80 volts if desired.

One characteristic which is the only disadvantage that has been found with this unit is that it is possible for both tubes to come on at the same time, thus no relay operation. This may be remedied by flipping the on-off switch of the B plus supply, or if this fails, removing one tube and then reinserting it. So far, out of approximately 100 times of test, the unit has failed to start only twice, and a second flip of the B plus switch started it on these two occasions.

For those persons who feel that 1.3 ma is not enough current to operate their relay, then R_5 may be lowered to 30 K to 40 K, and the combination of relay resistance plus R_4 lowered correspondingly. Should this be done, then R_4 should be reduced to around 5 K to 8 K to keep as much of the Hard-Bottoming effect as possible. However, this begins to bring in the interaction which was the reason this circuit was designed.

Radio Control News

(*Continued from page 29*)

light. If not, check wiring or placement of the tubes in the flea clips. Set 100k pot to maximum resistance and insert a 0-1ma meter between the pot and the receiver lead. If desired, a 0-10ma meter may be inserted in the second-stage relay lead; otherwise connect the relay lead directly to 45v plus. Connect the 45v battery into the circuit. Note the plate current reading on the first stage (CK-1054). If the reading is lower than about .3ma, the relay stage will conduct and the relay will pull-in. Adjust the pot toward minimum resistance until the relay drops out, or the meter indicates 0. Tune the receiver to a 27.255mc signal, upon receipt of which the first-stage plate current will drop and the second stage will rise to about 4ma. Now adjust the antenna coil so that the second stage is held non-conducting at the lowest pot setting.

For example, on initial tuning before adjustment of the antenna coil, the pot setting may give a current reading of .5ma, with the second stage not conducting. After adjustment of the coil, the second stage will still be cut-off and the first stage cur-

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Used to be . . . when a shopper wanted something, he or she went to their nearest general store. Wasn't much of a selection. The fellow behind the counter didn't have a big variety of any one thing. Oh, he had lots of merchandise but not much of a selection. Today, seems as though you need a consultant to buy any **one item**—there's **so much** of a selection. It's one of the big reasons **hobbyists** (as an example) look for the **Hobby Industry Association of America emblem** on a hobby shop window or displayed on the counter of a hobby department. That emblem kind-of tells a buyer, here's a fellow that can **help you** with your **selection** . . . that knows his merchandise . . . and by gum, can even show you how the models run. Yes sir, today's sign of the times for **smart** hobbyists is the **HIAA emblem.** Look for it the next time you shop hobbies.

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rent should drop (after pot adjustment) to about .4ma. This is not too critical. The receiver is now properly tuned, except for a field check at a distance of about 400 feet. No further tuning need be made on the set once the frequency is properly adjusted. Place a thin piece of sponge foam plastic under each tube and hold the tubes in place by means of a small wire clip as shown in the photographs. If desired, the tubes may be cemented to the foam, which is in turn cemented to the base, using Pliobond cement. A DL-66 tube (obtainable from Polk's) may be used in the second stage. This will limit relay current to about 2.2ma but it has the advantage of reducing filament current from 90 to 65ma. Next month we'll give circuitry which will enable you to use a transistor in the second stage and even use the Telamatic actuator without a relay on the receiver.

• • •

Many readers have sent in various gadgets to help them perform a ground check, especially when they are in isolated areas and don't have the company of other modelers. Fig. 3 shows the circuit used by L. G. Corviss, Box 561, Clarksdale, Miss. This circuit uses but four parts: a Gem relay, a switch, a 45v battery and a 100 mfd capacitor. It can be built into a very small box, which in turn may be plugged into, or wired into the transmitter. Pulse rate can be varied by varying the gap between the armature and the normally closed point of the relay. We found the Micro-Gem relay, with adjustable points, ideally suited for this use. Battery voltage was reduced to 30 volts and the capacitor was varied from 50 to 200 mfd with satisfactory results. The higher the capacitance, the longer the armature will remain pulled-in. (*Continued on page* 52)

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Next Issue M.A.N.

MEN and SHIPS

Louis Bleriot

Some time ago we announced the VO series of batteries as marketed by CG Electronics Corp., 15000 Central East, Albuquerque, New Mex. Recent tests and literature from CG provide the following information. One VO-100 will replace one AA pencell and save about ¼ of weight. One VO-250 will replace two pencells in parallel and save about ½ ounce of weight. One VO-800 will replace one D cell and save 1¾ ounces of weight. These batteries, or cells, do not require a rest period such as encountered with dry cells. They are leakproof if operated according to directions. Very high peak currents, compared to the amp/hr rating of the cell, may be drawn. Each cell may be recharged at least 500 times, which brings the actual cost of these cells compared to dry cells to a very low figure. For the same cost, the smaller size VO cells will provide the service rendered by a rather fantastic number of conventional flashlight cells. A simple charging device can be readily made, following the circuit given in the CG literature. Our tests so far have shown the cells to live up to the manufacturer's specifications and excellent service has been obtained. These cells look like they might be just the thing for that ¼A RC ship you have on the board.

CLUB NEWS

First of all we want to make sure all you steak eaters know about the free steak dinner to be given by Mr. Donald Sump of 659 Marion Street, Sheridan, Wyo. Mr. Sump made this offer last year and one man showed up, mainly due to bad weather. Two years ago this western town had one RC fan, Mr. Sump. Now there are 10 planes flying the western prairie. The Babcock Super Compound escapement is a big favorite due to the up-kick elevator arrangement. Anyway, all western fliers are invited to a flying session for RC on Memorial Day at Sheridan. Our mouth is still watering from a good western steak we had out that way about 15 years ago. The dinner will be held either Friday or Saturday so all those planning to attend be sure to check with Mr. Sump.

• • •

Canadian RC fans and those in the vicinity of London, Ontario, Can. are informed of the RC contest held by the Forest City Flyers. "The Radio-active Club," on June 7th and 8th. This will be an MAAC-approved South Western Provincial Regional (AAA) contest with an International Trophy Class being held for the first time. A Social Get-Together will be held on Saturday night, with a good time planned for all. Contest will be held at Kipps Lane, London, Ontario, Can. Contact Mr. George Rodgers, 184 Brampton Road, London, Ontario, Can. Rain date is June 14th and 15th.

• • •

Back in February there was a fair amount of activity by the Aerial Robots of Modesto, Calif., as reported in their Transmitter. Ben Ostling has a modified Tri-Pacer with a steerable nose wheel and brakes and powered with a Fox 59. Total weight is 10 pounds. Jim Rogers is building a Triple Threat from MAN plans, and will use Vari-Comps for control. Several other club members are using engine control via the Babcock Servo and operation is claimed to be excellent, due to being able to obtain any desired speed.

• • •

The Modulator, house organ of the Pioneer Radio Controllers, San Francisco, points out a few facts concerning the AMA insurance coverage. Did you know that there is no protection given if both parties to an accident have AMA insurance? Did you know that if an AMA insured flier hits a car on the field whose owner is also AMA insured, the car owner canot collect. When such an occurence arises, the entire membership of a club may be held liable. Many clubs on the east and west coasts have obtained special insurance policies which give broader coverage in such cases. Ed Stein has a Berkeley Cessna 170 that really stops the crowds, on looks alone. Bob Leininger nonchalantly drives a 9-channel proportional RC truck.

• • •

For many years there have been active clubs on both coasts but very few in the mid-west. An RC group in Peoria, Ill. is out to change this. They have a pretty well organized club and a paper known as The Peoria R-C Tattler, which is edited by Mr. J. H. McClintick, 3958 N. Brookside Drive, Peoria. Tentative plans were made in February for a Triple-A, AMA, radio-control contest, to be held on July 20th. This will be known as The Peoria Modelers Pre-Nats Warm-up. This club is showing RC films from other parts of the country and is making a library of their own.

• • •

A very interesting letter has come from Mr. Gerard Caillat, "Le Monastere," Ville d'Auray, Seto, France. Mr. Caillat comments that although there is little news of radio control clubs and groups in France,

(*Continued on page 54*)

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Wing area: 1326 sq. in. Wing loading: 10 oz./sq. ft.
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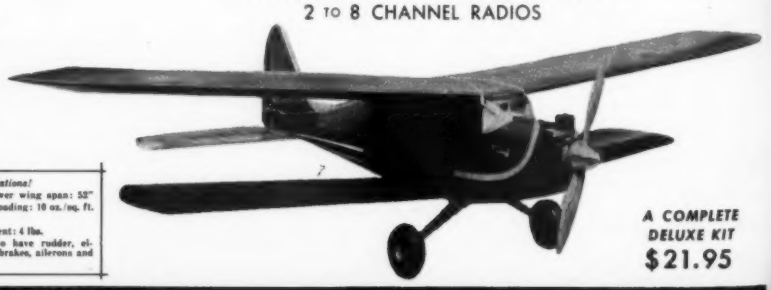

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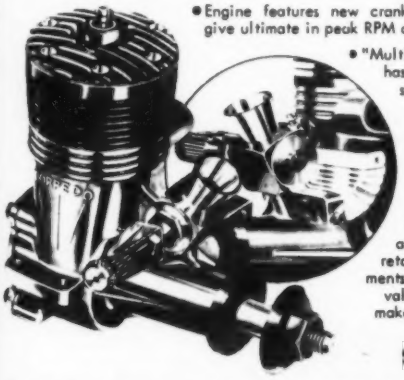
* K & B ALLYN TORPEDO .35 R.C.

Here is an engine that provides top R.P.M. and ticks-off the low R.P.M. required for radio control with complete in-between R.P.M. control. This wide range is brought about by the "Multi-Speed" carburetor with its built-in low speed adjustment screw which is standard equipment on the Torpedo .35 R.C. Now available at your local hobby dealer.



- Engine features new crankshaft porting — to give ultimate in peak RPM and a new low RPM
- "Multi-Speed" carburetor has built-in adjusting screw for low speed
- Built-in positive stop at "full open"
- Precision machined alum. body
- Precision ground steel barrel
- Easily cleaned on field by removing low speed adjusting screw - still retaining other adjustments
- Stationary needle valve assembly which makes it easy to adjust

$22.95

The PT-19 may also be equipped with any of the following K&B Allyn engines: Torpedo .15 ($10.95); .15 2-Speed ($11.95); .19 ($13.95); .19 2-Speed ($16.95); .23 ($13.95); .29S ($15.95); .29R ($15.95); .35 ($15.95)

K & B ALLYN COMPANY

5732 Duarte Street • Los Angeles 58 • California

* CG 8 CHANNEL RT-8 & T-8 R/C

RT-8 RECEIVER — $139.50

Frequency: 27.255 MCS. Power: 30 volts at 1.25 Ma idle. Weight: 8-1/2 ounces (with battery — 9-1/2 ozs.) Size: 2 x 2-1/4 x 4 ins. Printed circuitry. Housed in aluminum anodized case.

T-8 TRANSMITTER — $99.50

Frequency: 27.255 MCS. Power: 135 volts at 10 MA; 1-1/2 volts at 350 Ma.

Transistorized Receiver needs no filament battery. Transmitter is self-contained & hand held. Features simultaneous operation. All channels variable. Dual stick control permits easy operation. T-8 Transmitter has same stability as popular T-5. Order from your local dealer or CG Electronics.

Also suitable for PT-19: CG Single Channel RT-1 Receiver ($39.95) & T-1 Trans. ($33.95); 2 Chan. RT-2 ($69.95) or 3 Chan. RT-3 ($79.95) & T-3 Trans. ($59.95); 5 Chan. RT-5 ($119.50) & T-5 Trans. ($89.95)

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CG — AMERICA'S NO. 1 RADIO CONTROL MODEL EQUIPMENT

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AEROTROL

REVOLUTIONIZES RADIO CONTROL

Performance-wise and Price-wise

The "MARK IV" RECEIVER

Brilliantly engineered—an entirely new radio control receiver concept; A "modular-designed" combination tuner-transformer has all small components integrally attached; Tube is a "hard" 3S4; Relay is a genuine 6000 ohm Sigma Model 11F. Only 4 major parts to the entire unit yet gives maximum signal change from 4.0 to 0.8ma.! Entire lightweight designed unit is less than 3 ounces.

The "MARK IV" TRANSMITTER

An economy version of the famous "Super Aerotrol" transmitter that loses none of the dependable, proven performance. Hand-held metal case measures 3"x4"x8" and weighs only 3 lbs. Complete with case.

TRANSMITTER & RECEIVER

PREFABRICATED KIT
Requires Soldering & Test only (less batteries & crystal)
$15.95 Part No. DE-401K

COMPLETELY ASSEMBLED
Ready-To-Use (less batteries)
$24.95 Part No. DE-301

Operates on 27.255 frequency with crystal control. No Operator's License Required.

FREE BONUS:

Super Aerotrol ESCAPEMENT ($3.95 value.) Included with Mark IV Assembled Unit until October 30, 1958

NEW LOW PRICE

Berkeley's SIGMA RELAY

(Standard equipment on Mark IV Aerotrol) or sold separately for only $2.95 DE-404

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Beautiful, close-grained spruce sticks for R-C, Free Flight, Nordic or Combat. For any work that requires tremendous strength plus light weight. A MUST for every modeler.

PRE-WAR QUALITY JAPANESE TISSUE
SIX COLORS 18 x 20 SHEET 7¢

JAPANESE SILK
FIVE COLORS SQ. YD. $1.00

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FLIGHT RUBBER—MUSIC WIRE
CONTROL LINE WIRE

Ask your dealer—If he cannot supply you, send 25c for 44-page illustrated catalog of balsa, kits, motors and supplies, and sample sheet of SIG BALSA.

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The "Tick Off" Timer has proven to be the most accurate and dependable fuel shut off timer ever offered. Finest quality clock-work movement, crash resistant and contest proven. Guaranteed to satisfy.

The Tick Off

- Accuracy Guaranteed
- Dial selected motor run
- Built-in fuel shut-off, cannot jam
- Weight ½-oz.
- Nothing to adjust
- Not affected by heat or humidity
- Well made, crash resistant

Complete (including fuel line and mounting screws) $3.95 p.p.

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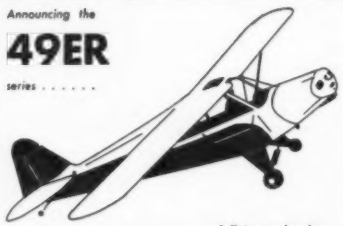
49ER

series . . . . . .



. . . . . of flying scale plans. 49" wingspan free-flight designs for .049 engines. Designed with the accent on flying, plans also include optional exact scale tail and dihedral detail.

Now ready, the Piper PA-11 Cub Special designed from factory plans and featuring scale rib spacing and cabin detail. Plans, $1.00 Postpaid first class mail.

FLEDGLING AERONAUTICS

P.O. BOX 33. CLINTON, INDIANA

there are a large number of individuals in this phase of modeling. Main reason is the Frenchman's individualistic spirit. While there is not a single RC club in the Paris area, more than 50 modelers are active. Also, equipment is scarce and high in price. Color pictures show shots of the Antwerp meet in September of 1957, with emphasis on Russian planes and Russian interest in Mr. Caillat's J-3 Cub and CG 5-channel equipment. Mr. Caillat is interested in having RC modelers who pass through Paris contact him. Phone number is Paris 926-66-26, and don't say we don't go all out to provide the RC modeler with service.

• • •

As you study the engine photo, don't blink your eyes and blame the heat or that last Dagwood sandwich at midnight. Mr. A. L. Evans, Jr., 4211 Forest Drive, Port Arthur, Tex. spent much time in building this 8-cylinder, composed of four K & B Sky Fury 15's. Total weight is 15 ounces, with Hi-tensile aluminum used for all mounting plates and main drive shaft. The shaft is mounted on small ball bearings and uses a standard thrust washer for the prop mounting. Firing order is from one bank to the other, with an impulse every 45 degrees of rotation. Swinging a 14-6 prop, the speed is 8,000 rpm. A smaller three- or four-blade prop will be tried when available. RC fans in the Port Arthur area have formed an active RC club known as the JERKS. Or to be more sophisticated, the Jefferson County Radio Kontrol Club. Flying is mostly single channel, with a few using multi. Incidentally, anyone having, or knowing where plans for a Custom Cavalier can be obtained, write Mr. Evans.

• • •

Mr. John Worth announces the 6th Annual RC Round-up, sponsored by the South Eastern Virginia RC group. This non-contest flying session will be held June 21st and 22nd with the Langley Air Force Base being the site. This will be AMA sanctioned and many technical sessions will be given on Saturday night. Contact John at 300 Patrician Drive, Hampton, Va. for further information on the event and motel space.

• • •

Mr. Fred W. Wallman, Jr., 6621 10th Avenue, South, Minn., Minn. announces that the Twin City Radio Controllers are having two RC, AMA-sanctioned meets this year. The first is May 25th, second on September 7th. The first meet, last year, was held at the General Mills Flight Center, so flying should be good as far as facilities are concerned. Many events and prizes are planned, plus movies, chalk talks and technical sessions. Plenty of new and unusual RC planes are in the vicinity so it looks like a gala time for the mid-west RC fan.

• • •

Jack Cooley, 6570 Buckingham, Allen Park, Mich. reminds us of the 2nd Annual ARC's radio control meet to be held at Marshall Airport, on M-56, at Monroe, Mich. on May 18th. Rudder-only, multi and scale will be the events, with all contestants required to have an AMA membership and FCC license. Motel space and radio cars are available to make this a pleasant event. May 17th will be used for sport flying and test flying.

• • •

Northeastern states RC fans should set aside the 4th of July weekend for the annual Flying Bison's get-to-gether. More on this later, just didn't want you to forget. They may even have the pylons built and painted by then, standing 10 feet high

(*Continued on page 56*)

Exciting News for Every Modeler! Perhaps the cost of building and operating your own complete R/C models has stopped you, like thousands of others, from enjoying the incomparable thrills of radio-control. Now, for the first time, complete packaged R/C is available at budget prices—from the world's most respected manufacturer of quality radio equipment and pre-fabricated model kits!

BABCOCK BREAKS THE R/C COST BARRIER!

Now at Affordable Prices—2 Authentic-Model Kits—Complete with all Radio-Control Equipment

35" Scale Model of Famous 125' North Sea Fishing Boat

31½" Scale Model of 63' Offshore Yacht

Complete Control: RIGHT, LEFT, START, STOP!

NEW "NORTH STAR" TRAWLER

Incredibly authentic in design and detail . . . breath-takingly beautiful with long, graceful lines of colorful pre-formed plastic!

Here is the proudest masterpiece we've ever designed. Yet it's fully equipped for authentic, realistic action—completely controlled by you! Easy to assemble and operate: complete instruction book included.

Look at all you get!

- Deluxe "North Star" Trawler Kit
- Deluxe Marine Hardware Kit
- Complete Radio and Actuating Devices: Transmitter, Receiver, Compound Servo (see bottom of page)

Only **$75.95** complete!

$85.95 with factory-assembled radio kits
Boat Kit only, $16.95—complete with propeller, etc. Deluxe fittings, $9.95

NEW "LITTLE BREEZE" DIESEL YACHT

A breeze to assemble! Simple, perfect-fit parts make this kit especially ideal for the new R/C enthusiast. It features authentic deck and superstructure of die-cut mahogany plywood; one-piece, high-impact molded styrene hull; and chrome-plated marine hardware, realistic in every detail. Easiest-driving hull for electric propulsion. Best of all, it's priced to fit the most modest pocketbook.

Package includes all this!

- Complete "Little Breeze" Yacht Kit
- Authentic Chrome-Plated Marine Hardware
- Complete Radio and Actuating Devices: Transmitter, Receiver, Compound Servo (see bottom of page)

Only **$69.95** complete!

$79.95 with factory-assembled radio kits
Boat Kit only, $19.95 (complete with all fittings)

Both Kits Include All Radio and Actuating Devices

"MAGIC WAND" TRANSMITTER

Powerful, versatile! Examination-free—27 mc. 6⅞" x 2⅛" x 2⅜". Available individually at $19.95 (factory-assembled, $24.95).

"MAGIC CARPET" RECEIVER

Weighs 2 oz. Only 2" x 3" x 1¾"—yet unmatched in range and sensitivity. Available separately at $21.95 (factory-assembled, $26.95).

ELECTRIC COMPOUND SERVO

Exclusive electrical cams! Positive control of motor (start and stop), rudder (right and left). Available individually at $8.95.

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Dependable Models in 1/2 the time...

JUST 3 HRS. (Basic part construction) to build **THIS HONEY OF A BIPLANE**

Scale Model
FOKKER

High quality sheet balsa fuselage, all parts precision die-cut

Scale 1" to ft. Full size decals of German insignia. Ideal for FREE FLIGHT or R/C with new small receivers—

ONLY **$4.95**

Exclusive • New • Different
A-1 NORDIC GLIDER

The only A-1 Class Nordic Glider on the market. Adapted from the latest and hottest German designs. With Auto Rudder and Pop-Up Dethermalizer, this model when properly trimmed will taxi flat without falling off on either side, to a position at end of line 164ft. straight overhead! Build it in 2 evenings—get into glider flying for new thrills and skills.

THE GHOST
ONLY **$2.95**

FLUTTERBUG

All modern sports model. Tricycle gear, butterfly tail, 200 sq. in. wing. Designed for easy building (about 3 hours) and good flying. All parts cut to fit.

ONLY $2.50

Just right for the new .020

MODELCRAFT since 1932
8945 SOUTH WESTERN AVENUE
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BUILD IN 4 HOURS!

RADIO CONTROLLED
KEYSTONE PACER
ONE OF THE FINEST FLYERS EVER DESIGNED

WINGSPAN 52"

FOR ENGINES .19 TO .25

Model can be assembled in four hours or less completely prefabricated not "pushouts" but clean cut pieces that Key in place and fit!

ORDER FROM KEYSTONE MODELS BOX 13 LEMOYNE, PA. **$7.95** POST PAID

BUILD IT YOURSELF AND SAVE $ $ $

Assemble this "instant-heat" pistol grip soldering gun from used radio transformer, and other parts, found around the home workshop. This highly efficient transformer-type soldering gun can be easily constructed from complete plans and instructions.

110V A.C. ACT NOW! Send only 50¢ to MODERN PRODUCTS Box 98 BRYAN, TEXAS

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You know its reputation . . . know it holds all world records for jet models. This year, put *your* plane out in front . . . with Dyna-Jet!

- **Weight: Only 16 oz.**
- **Develops 4½ lb. Thrust**
- **Fast Starting**
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Price:
$35.00

Send check or money order—your Dyna-Jet will be sent promptly, parcel post paid. (Reference: Citizens National Bank, Bedford, Ind.)

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MINIATURE Gasoline Steam ENGINES

Anyone with a 6" or 9" lathe and a drill press can make them.

BUILD THEM YOURSELF — IN YOUR OWN SHOP WITH YOUR OWN TOOLS

IDEAL SCHOOL-SHOP PROJECT

Send 10c for Illustrated Catalog of Miniature Engine Castings and Drawings

OCTURA MODELS
P.O. Box 536-MN Park Ridge, Ill.

with black and white checkered cloth covering. This group has a clever idea in having calling cards with their name and full information on one side and a map of their flying site on the other side.

• • •

NEW ITEMS

There's good news this month, in the transitor field. Philco price on the SB-100 surface-barrier transistor is now $3.50, reduced from $6.00. This transistor is widely used as a detector for 27mc receivers. The SB-100 is vastly superior to the AO-1 transistor which sold for about $2.40. The new price puts this well within the reach of all RC fans and should do much towards paving the road for new designs. In addition, there are many new power transistors which can be used to replace the relay in a receiver. Prices are as low as $1.35 and preliminary circuit testing shows them to work quite well. Incidentally, industry predicts that average transistor prices will be in the 25-cent range within five years. By average, we assume units for low to medium power audio work. If this is the case, we may have a complete multi-channel receiver for $5.00 one of these days. Don't laugh. As to circuitry for replacement of the relay with a transistor, stay tuned to this column in the near future.

• • •

Al Diem, 11111 Lund Place, Kensington, Maryland is offering transistorized power converters for transmitter use. A unit which supplies 150v at 35ma, with taps for 75 and 50 volts, sells for $24.95. Input voltage is six volts with an efficiency of 85%. A similar unit giving 92% efficiency sells for $31.50. The transformer only, with instructions for wiring sells for $8.25. A receiver converter is also available, with the transformer and instructions on this unit selling for $3.00. We have not seen these units yet, but assuming they are up to Al's excellent design and construction standards, you won't go wrong. The high efficiency of a transistor power converter compares to 60 to 70% for a vibrator type supply.

• • •

A good soldering job will eliminate many problems at a later date. ESSCO, 58 Walker St., New York, N.Y. has a 35w pencil-type iron with a built-in heat control. This is one of the finest irons we've seen and it sells for $4.95. Ideally suited for printed wiring assembly work, the small tip will get into those hard-to-reach spots. This iron and a good quality rosin core 60/40 solder, plus a few minutes spent in making soldered connections on scrap material, will pay off in the long run.

How To Design a Stunt Model

(*Continued from page* 21)

There are three basic things to consider when laying out the fuselage contour: 1. The frontal area should be kept to a minimum; 2. The majority of the side area should be located aft of the wing trailing edge; 3. Avoid large, round or bulky engine cowlings.

When using comparatively long tail moment arms, as we are, a total stabilizer and elevator area of between 15% and 17% is adequate. So, we can say 16% of 550 sq. in. gives us 90 sq. in. of total area. The stabilizer should be 52% of this total area, which gives approximately 47 sq. in. of stabilizer area and 43 sq. in. of elevator area. The rudder area should be between 7% and 8% of the wing area, or in our case. 35 or 40 sq. in.

We now have the basic components and

(*Continued on page* 58)

it's a fact*... champions prefer VECO products

*Veco products hold more national and international records than any other.

NEW! SMOG HOG

Howard Bonner's 1956 and 1957 National Multi-channel R/C winner. The first real stunt type R/C model. Wing span 72". Wing area 864 sq. in. Recommended engine: Veco ".35 RC"

NEW! VECO ".35 RC"

$19.95

Has power you need for top R/C performance. Equipped with throttle for servo or escapement operation. Adjustable stop for idle setting. TCC

Veco ".35"

$15.95

A smooth running engine that delivers maximum thrust with dependability. Advanced Veco carburetion, improved cooling and TCC

Veco ".29" Veco ".19"

$15.95 $11.95

A pair of rugged power plants with rapid acceleration and constant power output you need for competition flying. Advanced carburetion, improved cooling, TCC Temperature Co-trolled Clearance

MUSTANG

C-7

$8.50

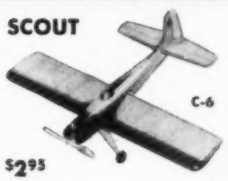
Semi-scale U-control model of famous F-51. Good stunt plane and a scale beauty. Wing span 48". Recommended engine: Veco ".29"

THUNDERBIRD

$8.95 C-11

Has won more national, international contests than any plane manufactured. Wing span 54". Wing area 597 sq. in. Recommended engine: Veco ".35"

SCOUT



C-6

$2.95

Ideal lightweight stunt trainer – perfect for beginners. Wing span 25". Recommended engines: .049 to .074.

TOM-TOM

C-12 $4.50

Lightweight, low cost model for learners or sport. Easy construction. Wing span 40". Recommended engine: Veco ".19"

SMOOTHIE

C-8

$7.95

Bob Palmer's contest stunter. For advanced aerobatics, windy weather. Wing span 52". Wing area 501 sq. in. Recommended engines: Veco ".29" or ".35".

WARRIOR

C-2 $5.50

Realistic, rugged, reliable stunter with flaps. Easy to build and fly. Wing span 36". Wing area 125 sq. in. Recommended engine: Veco ".19".

SQUAW

$5.95 C-4

Little sister to the Chief. Full span flaps for real performance. Wing span 38". Wing area 346 sq. in. Recommended engine: Veco ".29".

PAPOOSE

$4.50 C-5

A smaller version of the Chief with full span flaps. Excellent stunt model. Wing span 32". Wing area 248 sq. in. Recommended engine: Veco ".19".

CHIEF

C-3

$6.95

Super stunt model with a world-wide reputation for top performance. Wing span 54". Wing area 595 sq. in. Recommended engine: Veco ".35".

TOMAHAWK

$3.50 C-10

A profile plane for combat or learning to fly. Quick, easy construction. Wing span 40". Wing area 138 sq. in. Recommended engines: Veco ".19" to ".35"

REDSKIN

C-9 $5.25

A hot plane for team or rat racing. Simple, fast construction. Fun to fly. Wing span 31". Wing area 170 sq. in. Recommended engine: Veco ".29".

SIOUX

F-2 $3.25

Rugged free flight sportster for beginner or expert. Easy to build and fly. Wing span 36". Wing area 180 sq. in. Recommended engines: .049 to .074

NAVAJO

$2.95

Free flight contest model for beginner or expert. Dethermalizer equipped. Wing span 36". Wing area 180 sq. in. Recommended engines: .049 to .074

BRAVE

C-1 $5.25

Stunt trainer for the novice. Easy to build and fly. Wing span 36". Wing area 288 sq.in. Recommended engine: Veco ".19".

DAKOTA

F-1 $3.50

Free flight biplane that has world-wide reputation. Unusually easy construction. Wing span 24". Wing area 161 sq. in. Recommended engines: .049 to .074

TAYLOR CUB

F-10 $2.95

Popular free flight scale model. Lightweight construction gives unusual performance. Wing span 35". Wing area 158 sq. in. Recommended engines: .049 to .074.

COMMANCHE

$3.25 F-3

PAA type free flight model. A real performer! Wing span 36". Wing area 180 sq. in. Recommended engines: .049 to .074

VECO PRODUCTS ARE SOLD BY LEADING HOBBY DEALERS EVERYWHERE ... VECO PRODUCTS CORP., BURBANK, CALIF.

IMPORTANT NEWS—FROM RADIO CONTROL CENTER—U.S.A.
ESSCO RC PRODUCTS
For Reliable Performance, Stability of Operation, Low Cost, Long Life

RC FACTS: It is a fact well known to all in this hobby that the advent of the Esco-Lorenz twin tube receiver 5 years ago did more to popularize RC than all other sets. Use of this extremely sensitive and stable circuit enabled modelers with little experience to easily and inexpensively obtain reliable performance always strived for but usually difficult to obtain by the so-called simple one tuber sets and sometimes with multi-tubers. Best proof of this is in contest results of past years. 75-80% of highest scores were achieved by modelers using some version of the Lorens set. In this year of 1958 with the many new developments in electronics presently available the old reliable Esseo-Lorenz using the new stable tube CK1054 is still your best buy in simple-reliable RC at a price within reach of all. Be convinced and try on a money back guarantee one of our '58 ECON-LORENZ sets. TOP QUALITY TWIN TUBE performance at single tube set price . . . only available from Essco. Features small, lite-weight unit with 1st grade parts & GEM relay $18.95

Deluxe parts kit with all parts, tubes, relay .... $ 9.96

ESSCO-LORENZISTOR receiver features CK1054 1st stage & ultra stable transistor relay stage. TINI plastic case allows use in smallest models. Complete with MICRO GEM relay & Hillcrest battery case for single unit installation. Ideal for beginners & oldtimers too. $21.95

ESSCO'S search for a simple-reliable receiver during the period when reliable tubes for the Lorens receiver were unavailable resulted in the revolutionary ESSCO THT sets. Reliable sensitivity with staypat adjustments, economical A & B battery consumption has always been the goal striven for in a simple receiver at down to earth prices. The ESSCO THT's are proud to say more than meets these specifications. Proof of this is in the fact that more than 2000 users of this set praise it as tops in RC. The '58 THT receiver is even better. Results are simply fabulous and unbelievable. Equal performance is now available in the long awaited 50 mc. THT receiver. Skeptics please take note: Order one of our '58 models, try it for 10 days and if it does not give you the performance as claimed then return it and we will gladly exchange it for any receiver on the market selling for up to $26.95. Where else can you find equal guarantees? THT-27 model use Amperex 6007 1st stage, 1AG4 or CK521 2nd stage, MICRO GEM relay. For 30 or 45 volt B battry. Plastic or aluminum case as preferred $21.95

NEW THT-50, super performance on 50-54 mc. $23.95

ESSCO, AS ALWAYS-FIRST with latest in MULTI RC and at down to earth prices all can afford. THE ESSCO MULTI-8 XMTR ASSEMBLY. A factory wired & tested RF unit with stable 8 channel audiotone generator modulator. A complete unit ready to install in your own case. Will operate all 3-5-8 channel reed receivers now in use. Gives simultaneous operation of two controls as desired. Features ultra stable MOPA RF and audio circuitry with remote stick box control. Unit may be installed in ground case with heavy duty batteries or power supply units. Price complete less case, antenna, batteries $74.95

BRAMCO REGENT 8 multi-channel receiver .. $116.00

BRAMCO 8 chan. simultaneous XMTR/cntrl bx. . $118.00

C.G. RT-8 all transistor 8 channel receiver $139.50

C.G. T-8 transmitter with antenna ..... $ 99.95

New Citizen-Ship Multi Simultaneous 8 channel equipment. MSR-8 receiver & MST-8 transmitter, ea. $ 99.95

Special Essco power supply to eliminate A & B batteries in BRAMCO 5-8 chan. XMTR, easy to install. $ 15.95

NEW ITEM. Pocket Multi-tester with bulletin sens. FSM. Molded bakelite case 2¼x4x1¼. Reads 0—1.5—50—150 volts, 0—1—5—50—150 ma. Includes 0-100K ohmmeter. .5 ma FSM Ideal reliable all purpose test set, only ..... $ 13.95

Looking for Reliability in Transmitters?

HIPOWER MAC II hand held 5 watt XMTRS in handsome new metal case. Complete ready/use ..... $ 21.95

MAC II 5 watt powered hand model, w/cell .... $ 34.95

LORENZ MOPA, same as above full 5 watts .. $ 37.95

Total wt. above powered models less than 4 lbs.

COMPACT HIPOWER wired-tested 5 watt RF assembly. Use to modernize or build your own preferred setup. Size only 2¼x4. Includes 27mc crystal, 1st grade tubes & insulated keyer jack. Models available include popular MAC II 5 watter ..... $ 14.95

LORENZ 5 watt MOPA, industry's most reliable $ 17.95

MOPA RF Assembly w. Hartley audio tone unit $ 24.95

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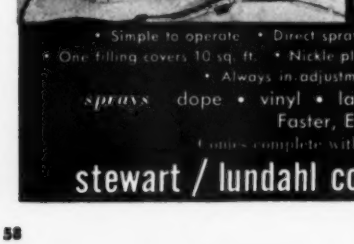

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their configurations. There are many ways to apply these to suit the individual modeler's choice.

There is one point in control line flying which is stressed altogether too little, and that is the control system. It should be as free as possible, with no binding whatsoever. Too many modelers neglect this very important point.

While on the subject of controls, let's set up the amount of movement needed for the flaps and elevators. The general opinion has been that the flaps should not move more than 25% to 30%. However, when using a tail moment arm as long as the one we have designated I use approximately 45° of movement in both the elevators and flaps. This arrangement has worked out best for me, and it is the linkage I have used on my Nobler design.

There is no design that is worth its weight in feathers unless it is "properly" synchronized with all of its "proper" components. For instance, a model which is perfectly designed but which is powered with an engine that does not run smoothly, due to improper fuel drawing characteristics, can hardly be considered a contest winning combination, or even fun to fly. Back in the old days of stunt flying, we used to fly big (750 sq. in.) jobs with an Anderson Spitfire .65 up front. The engine had plenty of power but was very critical in its ability to draw fuel. After many washed-out models, and the accumulation of a drawer full of experimental shapes, the fuel tank illustrated was arrived at. It has served me faithfully for over nine years. The dimensions shown will give more than enough time to execute the 1957-58 stunt pattern.

With the take-off and landing being an important part of the pattern, attention should be called to the landing gear and its location. Bill Netzeband covered this subject most thoroughly in his article previously published in MAN. I will add that it is most desirable to get the model low to the ground with the wing at a low angle of attack.

One of the biggest mistakes made by those who fly stunt is to use fuel with a high nitro content. The high nitro stuff is strictly for speed, combat, free flight, etc. A good commercial sport fuel or a mixture of three parts methanol and one part degummed castor oil is all that is needed. If you are going to fly competition stunt, you must practice a great deal; at least 50 flights a week. There is no substitute for practice. The more you practice the better your chances are for winning.

There are a few simple rules to follow in flying the stunt pattern. These rules are all concerned with where to start your maneuvers in relation to the wind direction. They are as follows: 1. Take off down wind. 2. The reverse wing-over should be begun with the wind blowing into your face. 3. All other maneuvers except the overhead figure eight should be done with the wind at your back. 4. The overhead figure eight, like the reverse wing-over, should be begun with the wind blowing into your face. 5. The landing should be made on the down-wind side.

One of the things that is most important to a stunt flier is his flying handle. Most modelers use a handle that is much too large and heavy! For years this writer has wished he could just tie the lines to his fore and little fingers and fly in this manner. In fact ½ A's are flown this way. You can make a very nice handle with very little effort. Simply take a piece of ⅜ in. thick plywood measuring 2⅜"x 6" and mark off the width of your hand on it. Then cut out your handle to whatever shape that

fits your hand the best. You may even install an adjustable mechanism by "robbing" one of the commercial handles now on the market.

One final word of warning: WARPS! Warps are the scourge of any serious stunt flier. If your model starts developing a warp at any stage in your building, stop, right where you are, and get it out before you go on. This one thing is responsible for more "dud" stunt models whether they be originals or kits than any one thing.

As one stunt addict to another I sincerely hope all this gab is of some aid to you. At any rate good luck on your new ship. Who knows it may win the '58 Nationals if you practice enough.

Contest Calendar

(*Continued from page 2*)

18–*Los Alamitos, Calif.* (A) Thunderbugs' Meet for FFG and rocket. Jim Scarborough, C.D., 527 E. 55th St., Long Beach, Calif.

18–*Tulare, Calif.* (A) Tulare Sky Kings' Meet for FFG, OR, TLG, and OHLG. Fred H. Hover, Jr., C.D., 1000 N. Jacob St., Visalia, Calif.

18–*Manchester, Mo.* (AA) Double Cola Model Club Rat Race. W. F. Netzeband, Jr., C.D., 944-A Edna Ave., Kirkwood 22, Mo.

18–*Seattle, Wash.* (AAA) Northwest Regional Model Aviation Meet for OHLG, RC, CLC CLS, NC, CL, RR, and rocket. August Kerzie, C.D., 6733 13th, N. W., Seattle 7, Wash.

18–*Muncie, Ind.* (A) First Muncie Invitational Meet for CLS, CLC, and RR. Restricted to Ind. Model Aviation Assn. members. Harry W. Ryks, C.D., 212 No. Bittersweet Lane, Muncie, Ind.

25–*Fresno, Calif.* (RT) Fresno Gas Model Record Trials for FFG. Jim Scheidt, C.D., 2225 Brown Ave., Fresno 3, Calif.

25–*Pittston, Pa.* (AA) First Annual Control Line Joust for CLC, CLS, novelty, and destruction derby. A. J. Koveleski, C.D,. 331 Adams Ave., Scranton, Pa.

25–*Morristown, N. J.* (AA) Second Annual Invitational Meet for RC. S. Gilbert Evans, C.D., 600 Beech Ave., Fairlawn, N. J.

25–*Largo, Fla.* (AA) 3rd Annual Largo Prop Twister Meet for CL, CLFS, CLS, and CLC. Claude J. Rinehart, C.D., 711 2nd St., S.W., Largo, Fla.

25–*Minneapolis, Minn.* (AA) Twin City All Radio Contest for RC. Vernon Jones, C.D., 2928 14th Ave. So., Minneapolis, Minn. Pending.

25–*Kansas City, Mo.* (AA) Flying Fools' Annual Control Line Contest for CLS, CLC, and RR. Peter W. Asjes, C.D., 5313 Ralston, Kansas City 33, Mo.

30–*Union, N. J.* (AA) Union Model Airplane Invitational Meet, for CLS, CLC, NC, proto speed, RR, beauty, and novelty. Clifford M. Propst, C.D., 600 Chestnut St., Union, N. J.

30-31–*Tulsa, Okla.* (AA) Tulsa Glue Dobbers' Second Annual RC Meet. Willard H. Kehr, C.D., 4940 No. Johnstown, Tulsa, Okla.

31–*Winder, Ga.* (AA) 1st Annual GA/RC Meet for RC. Al Pinson, C.D., 2171 Melante Dr., N. E., Atlanta 5, Ga.

31-June 1–*Longview, Tex.* Pending.

JUNE

1–*Van Nuys, Calif.* (AA) San Valeers' Bimonthly Free Flight Contest for FFG and OR. Eugene P. Wallock, C.D., 350 N. Duane Ave., San Gabriel, Calif.

1–*Galesburg, Ill.* (AA) Galesburg Model Airplane Club 9th Annual Memorial Day

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PLAN OF THE MONTH

47. FOKKER E-3: 1/2A, FF, Scale.
NAVY RACER: Rubber, semi-scale.
WOODY: .29-.35, UC Combat. Hot!
E-3, beautiful model, fine flier.

1. GIMLET: RC Low wing .049.
ROYONO: Contest FF A&B.
So low wings RC are new? Gimlet started it all!

2. COMPER SWIFT: ½A, FF, Scale.
MULVIHILL WINNER: Rubber.
THE LIEUTENANT: UC Stunt, .29-.35.
If it's scale you like, the Swift is a wonder!

3. BUSTER: Rubber, Sport
THIRTEEN: UC Stunt, .29-.35.
VOUGHT SBU-2: UC, Scale, .19-.29.
Buster. Ideal for beginners on way up.

4. SURE FUN: UC Sport, .29-.35
PROFILE SILVAIRE: FF Profile, ½A.
ZEPHYR: Rubber, Fuselage
Control line on floats. Sport Gassie.

6. HIGGINS CABIN CRUISER: RC Boat, .09-.19.
FOKKER D7: Scale, U/C, .29-.51.
The great all-time favorite? Try the Fokker D-7.

7. WORLD CHAMP GL.: Nordic Winner.
HI BOY: Cabin Stunt, Palmer-Goyet, .29-.35
POW WOW: Bob Palmer stunt, .29-.35
Collector's item—two Palmer models!

8. GEE BEE: Scale U/C, .19-.25.
DRAKE: FF, flying boat, .049.
DURANITA: FF, bipe, .049.
More people built the Drake than any other ship.

9. AEROCOM'DER: Scale, U/C, 2 .15.
MARS: Bob Palmer stunt, .29-.35.
NOBLER: Aldrich's Nats Winner, Stunt, .29-.35. **Palmer and Aldrich, plus a twin ukie. Imagine!**

10. SMOG HOG: Bonner's Multi RC, .19-.35.
STRATOLINER: 2 Half A, U/C.
GUARDIAN: U/C Scale, .29 up.
Greatest Multi RC of all time—a beauty!

11. GAMBLER: Mirror Stunt Winner, .29-.35.
DOUGLAS B-66: ducted fan FF, .049.
B-66, the ducted fan job that beats all others.

12. WHIRLING WINGS: Sikorsky XH-5, .15, 'copter.
BREEZY: Small field RC, .049.
SPITFIRE: Stunt, semi-scale, .29-.35.
P. Schoenky, 'copter master—his Sikorsky!

13. T-CRAFT: FF scale, .049.
FENO: Combat, stunt, .29-35.
PADDY'S WAGON: Contest FF, .049.
Paddy's Wagon—one contest job ok for beginner.

14. HEATH PARASOL: RC, FF, Scale, .075 .09.
GUARDIAN: Nats carrier winner, .29's.
SHARPIE: FF Sport, .02-.049.
—Guardian a dilly.

15. RE-8: WW1, U/C. .29-.35.
FLAPPING WINGS: Rubber, ornithopter.
BOOMER: FF, sport, pusher, .049.
Can planes fly like birds? Ornithopter sure does.

16. DRAGGIN: U/C Stunt .049.
BLACKBURN: 1912 Scale FF .049.
ASCENDER: Contest FF .049.
Wind in the wires. Goggles. Oh, that Blackburn.

18. PAACKHORSE: PAA Load FF .15.
AIRNOCKER: Scale, FF .049.
What model hit the jackpot? Airknocker—the Champ.

19. TRAVEL AIR 2000: U/C Scale .23-.29.
RESCUE CRAFT: RC Boat for .09-.29.
RAMROD 250: Contest FF, .049.
Greatest contest free flight in history—Ramrod.

20. FIERCE ARROW: Stunt, U/C .35.
WRECKTANGLE: ½A FF.
BREATHLESS: ½A Radio.
Unique trio—each brilliant design in its class.

21. FAST MILER: U/C Proto, .29.
PEE WEE PAL: .02 FF sport.
THE VICTOR: RC, RUD., .15-.19.
The Proto Racer is tops; 1200 flights on Victor.

24. AEROBAT: U/C Stunt, .29-.35.
SNOOPY: Cute 1/2A FF bipe.
SEAGULL: Flying wing tow-liner.
Small fields, sport? Try Snoopy.

27. FLAMINGO: RC Amphibion, .15-.23.
UPSTART: Best B-C FF, on .29-.35.
NACA planing hull make Flamingo stand-out RC. UPstart—it goes!

42. TENDERFOOT: 1/2A, FF, beginner
BIG D: FF, delta, .049-,15.
WESTWIND: RC, 1/2A, low wing.
Three stand-outs—good but different!

43. EQUALIZER: .15 to .19 multi, RC.
QUICKIE TRAINER: Speed, .29.
AMAZOOM: FF, contest, .15.
deBolt's best, the Equalizer? Amazoom—Stan Hill's hi-thrust.

44. CONVAIR'S DELTA: Jetex FF.
LIL DYNAMITE: .15 stunt, UC.
SWAT: ½A, FF, contest.
A trio of exceptional planes.

45. ASTRO-HOG: Multi RC, .29-.35
MITCHELL: Profile, .09's, .15's UC.
Dunn's low wing radio—tops! Nothing matches this multi. The Mitchell a fine flier.

46. PROPJET B-47D: U/C, .15's.
RUFFY: Stunt, .29-.35.
NOR'EAST'ER: Nordic glider.
B-47D, beaut of a project Ruffy: big winner—it's new!

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26. Corsair, Gyro-Glider, Santanita
27. Flamingo, Upstart
29. Cougar, '55 Nordic Winner, Dizzy Boy
30. Great Lakes Trainer, Triple Threat RC
32. Mig-15, Fifinella, Coquette
33. Skyraider, Dunwoody's Nordic, Flexi-Bull-It
34. Corben Super Ace, Cessna 310, Profile Lightning
35. Dyna-Jet Mig, Gramps
36. Stunt Trainer, ABC Robin, Blitzen
38. SE-5, Curtiss Robin, Nobody
39. Rearwin Speedster, Stunt Wing, Rambler
40. Mustang, Bi-gone, Gliders 5

Meet for CLC, proto speed, RR, CLS, CLFS. Andrew G. Walsh, C.D., 1229 E. Knox St., Galesburg, Ill.

1–*Delaware, O.* Pending.

1–*Goodland, Kans.* (AA) N. W. Kansas Gashoppers' Meet for FFG, RC, FFFS, and RC Boats. Kenneth Armstrong, C.D., Goodland, Kansas.

1–*Charleston, W. Va.* (AA) Capitol City Comets' Meet for CLC, CLS, RR, and CLFS. Clarement Ball, .D., 1047 Beech Ave., Charleston, W. Va.

1–*Lansford, Pa.* (AA) 2nd Annual King Coal Meet for CLC, CLS, beauty, and NC. Michael Kuntz, C.D., 420 Washington St., Tamaqua, Pa. Pending.

1–*El Paso, Tex.* (AA) El Paso Model Club Meet for FFG, RC, RR, CLC, CLS, and TLG. Capt. Richard Moorhead, .D., 4916 Wichita Dr., El Paso, Tex.

1–Anchorage, Alaska (AA) Alaska Snowbirds' Contest for RC, CLS, CLC, and CLFS. Russell C. Snyder, C.D., 317 F.I.S., APO 942, Seattle, Wash.

5–*Detroit, Mich.* (AA) FAI Team Event. Edwin G. Moran, C.D., 7245 Coolidge, Centerline, Mich. Pending.

7-8–*Memphis, Tenn.* (AA) T.A.M. Meet for RC. Dewey L. Wharton, C.D., 1617 Mary Dr., Memphis, Tenn.

7-8–*So. Weymouth, Mass.* (AAA) Yankee Championships for FFG, OR, TLG, CC, PL, IHLG, IR, CLS, CLC, CLFS, CL, and RC. Edward G. Dolby, C.D., 25 Exchange St., Rockland, Mass.

8–*St. Charles, Mo.* (AAA) St. Louis I.A.S. Model Airplane Meet for FFG, TLG, OR, RC, CLS, CLC, CLFS, and RR. Parnell Schoenky, CD., 125 E. Maple Ave., Kirkwood 22, Mo.

8–*Traverse City, Mich.* Pending.

8–*Shelby, O.* (AA) 2nd Annual Jaycee Meet for FFG and RC. Howard L. Robinson, C.D., Shelby Pure Milk Co., Shelby, O.

8–*Fayetteville, N. C.* (AA) 8th Annual East Carolina Model Meet for CLS, CLC, CLFS, and TR. Dewey C. Barefoot, C.D., P. O. Box 4126, Fayetteville, N. C. Pending.

8–*Wichita, Kans.* (AA) Wichihawks' Sixth Annual U-Control Contest for CLC, CLS, RR, CL, and CLFS. James Z. Paysen, C.D., 1519 N. Battin, Wichita, Kans.

8–*Madison, Wisc.* (AA) Mad Mac Midwest Meet for FFG, CLC, TLG, and RC. Norman Michie, C.D., 212 Bordner Dr., Madison 5, Wisc.

8–*Santa Barbara, Calif.* (AA) Control Line Combat Contest. Stanley D. Hill, C.D. 1020 State St., Santa Barbara, Calif.

8–*Anchorage, Alaska* (AA) Alaska Snowbirds' Contest for RC and FFG. Russell C. Snyder, C.D., 317 F.I.S., APO 942, Seattle, Wash.

8–*West Allis, Wisc.* (AA) Third Hobby Dealers Assn. of Wisconsin Model Aircraft Meet. Restricted to residents of Wisc. Robert Eggleston, C.D., 2857 So. Linebarger Terr., Milwaukee 7, Wisc. Pending.

8–*Endicott, N. Y.* (AA) 3rd Annual RC Contest. Bernard Fox, 713 Delano Ave., Vestal, N. Y. Pending.

8–*El Paso, Tex.* (RT) Record Trials for free flight classes. Capt. Richard Moorhead, C.D., 4916 Wichita Dr., El Paso, Tex.

14-15–*Kansas City, Mo.* (AA) Radio Control Contest. Carl E. Lindsey, C.D., 805 S. 18th, Blue Springs, Mo.

14-15–*Dallas, Tex.* Pending.

15–*Deer Park, N. Y.* (AA) Sky-Scrapers' 14th Annual Model Airplane Championships for FFG, TLG, OHLG, OR, rocket, and free-for-all. William Dunwoody, C.D., 457 73rd St., Brooklyn 9, N. Y.

15––*Danville, Ill.* (AA) Danville Second Annual U-Control Jamboree for CLC, CLS, and CLFS. James R. Grack, C.D., 22 W. North St., Danville, Ill.

15–*Topeka, Kans.* (AA) Topeka Parrots' First Annual Model Airplane Contest for CLFS, CLS, and CLC. Leland W. Weber, C.D., 1911 Gage Blvd., Topeka, Kans.

15–*Berwick, Pa.* (AA) Busy Bees' Model Airplane Meet for CLC, CLS, rocketry, and clobber. Charles T. Cooper, C.D., 531 Broad St., Nescopeck, Pa.

15–*Longmont, Colo.* (AA) Second Annual Longmont Model Meet for CLS, CLC, CLFS, and RR. Dean Schmoker, C.D., RR 2, Box 268, Longmont, Colo.

15–*Hartford, Conn.* (AA) Greater Hartford 2nd Annual Rat Race. Al Zepka, C.D., 34 Highview Ave., Wethersfield, Conn.

Fokker E-111

(*Continued from page* 10)

parts from ¼" sheet. Build rudder flat on board. Drill two small holes in the rudder post and insert hinges. Cement in securely. Round off edges but do not sand airfoil shape. The prototype was also flat.

Make stabilizer spar by soaking 1/32" sheet balsa in water and bending around an ¼" form and allow to dry. When dry, cement seams and cut to length, slip ribs onto spar. Leading and trailing edges will have to be blocked up due to the symmetrical section. Slip stabilizer onto fuselage dowel. If fit is too loose, give dowel several coats of dope. If still loose, dope tissue around dowel.

Machine gun was made with a brass shim stock barrel and balsa. Balsa can be used for the entire gun.

Covering: The original model was covered with Jap tissue and given three coats of plasticized clear dope (several drops of castor oil per ounce of dope mixed) and two coats of color. Then trim and markings were added. Cowling and sides back to cockpit were covered with aluminum foil for extra realism. Extra details on trim can be found on the Nieto drawings.

Rigging now is added. I used .015 wire, looping the ends to engage the hooks; however, heavy thread can be used. You will notice that all landing wires are rigid. This allows you to set up the dihedral angle to suit yourself. The flying wires are all rubber band-loaded to allow the wings to flex in flight and also on hard landings.

Flying: The model should balance at the Center of Gravity position indicated. Weight will possibly have to be added to the nose, if an .049 is used. I do recommend the use of an .074 engine but extreme care must be taken during adjustment.

My E-111 weighed in at 14 oz., not a light weight for an .049. The model flew very realistically, having a shallow climb to the right. The results were disappointing while at the '57 Nats when the wind velocity increased and the .049 just did not have enough power. I feel an .074 would have made it successfully. The glide is fast but flat and it's quite a feeling to hear the wires singing after the engine quits.

Glide your model until a nice flat glide is obtained. Adjustment can be made by the movable stab. Take your time and be certain as a bit of haste here can wash out many hours of work in a few seconds. When you are satisfied with the glide, power flights should be tried. I recommend making all power attempts from a take-off position. Then, if anything drastic happens it usually will happen on the ground. If it is impossible to take-off, then launch over tall, soft grass.

Do not attempt to adjust the model when it is windy.

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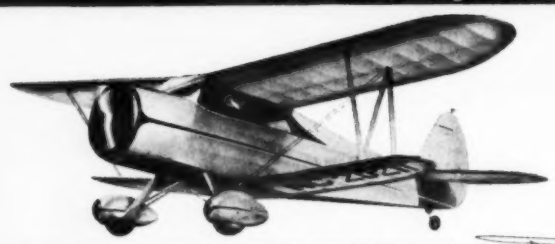
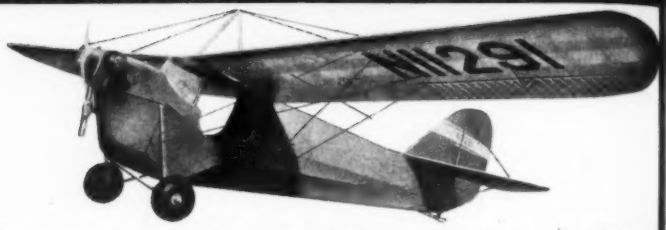
Berkeley's CHAMPIONSHIP "1/2 A" FLYING SCALE

1" = 1' Scale . . . For Free-Flight . . . Controline . . . or Rubber Power!
For .035 to .049 Engines Free-Flight . . . .049 to .099 Engines Controline (except as noted)





"WACO CABIN"

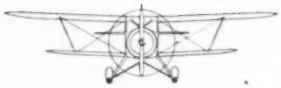
For ½A Free-Flight — Controline 1" Scale — 35" Wingspan

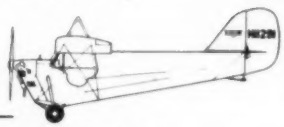
For "½A" Engines — .035 to .074 Kit No: 4-13

$3.95

less wheelpant material

An unusual addition to our line of 1" Scale Championship designs. The "Waco" is easy to adjust and an unusually stable and high performance craft. As a Controline, its scale appearance and perfect proportions team up to make a fine flyer for everyday or Contest Flying Scale events.





AERONCA "C-3"

For ½A Free-Flight — Controline 1" Scale — 36" Wingspan

.020 to .051 Engines

Kit No. 4-12 **$2.50**

This kit now joins other Berkeley 1" Flying Scale designs, a series which has won this event at the Nationals consecutively since 1938. Structurally simple, the "C-3" can be assembled and flown in a few days time. Flies well with high or low power free-flight or controline. Plans show both types.

- Authentic Multi-color Decals
- Formed Gear, Rubber Wheels
- Die-Cut Balsa and Plywood Parts
- Metal Hardware and Covering Material
- Full Size Berkeley Detailed Plans!

$2.50 Kit No. 4-3

CESSNA L-19 "BIRD DOG"

36" Wingspan

Two seat observation plane used on a large scale in Korean War by the U.S. Army and the U.S. Marines. A large number of these are used by National Guard units. Powered by 213 h.p. Continental—120 m.p.h.

Kit No. 4-1 **$2.95**

PIPER "SUPER CRUISER"

35" Wingspan **$2.95** Kit No. 4-9

Three place cabin monoplane originally introduced as the "Cruiser" in 1940 with 75 h.p. then as the "Super Cruiser" after World War II, with 104 h.p. and then in 1948 as the four place "Family Cruiser". "Super Cruiser" had a maximum speed of 115 m.p.h.

STINSON SENTINEL "L-5"

33½" Wingspan

Two place liaison and observation plane first flown in 1941. 1731 L-5's were built during World War II. Still in use by the U.S.A.F., Italian Air Force, and the Japanese Air Defense Force. Powered by 190 h.p. Lycoming. Maximum—139 m.p.h.—112 m.p.h. Cruising.

CESSNA "180"

35" Wingspan

Four place cabin monoplane introduced in 1953 using the same wing as the "170" but with a re-designed fuselage and tail unit. Powered by a 225 h.p. Continental Engine. Maximum speed is 165 m.p.h.

$2.95 Kit No. 4-7

FAIRCHILD 24 "RANCHER"

36½" Wingspan

First produced in 1933 as a two-seater. In 1936 was introduced as a four place model using either a radial Warner engine or an in-line Ranger. Military version was known as the YC-61 "Forwarder" by the U.S.A.F. and the "Argus" by the R.A.F. Production resumed for business use after the war. 132 m.p.h.

Kit No. 4-5 **$2.50**

"AERONCA SEDAN"

34" Wingspan

Featured as a landplane, plans show pontoon details for those desiring the added thrill of water take-offs. Finished model is really spectacular.

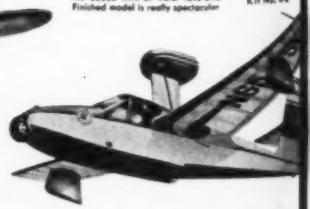
$2.50 Kit No. 4-8

"SUPER CADET"

35" Wingspan

Known as the "Interstate Cadet" before World War II and currently built by Call Aircraft Co. Two place—power was 65 h.p. It is now stepped up to 125 h.p. with an increase in maximum speed to 135 m.p.h.

Kit No. 4-6 **$2.95**



$2.50 Kit No. 4-2

STINSON VOYAGER "150"

.34" Wingspan

Originally built by Stinson division of Consolidated Vultee. Added to the Piper line in 1948. Four place 165 h.p. Franklin engine. 162 m.p.h. maximum speed.

COLONIAL "SKIMMER"

(Not for Rubber Power) 33½" Wingspan

The hull design is perfect for realistic water take-offs.

Three place amphibian with retractable landing gear. Nose wheel protrudes when retracted to serve as a bumper. Powered by 125 h.p. Lycoming, 125 m.p.h.

Kit No. 4-11 **$3.50**

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"BUHL PUP"

1¼" Scale — 37½" Wingspan

Kit No. 4-10 **$3.50**

The "Buhl Pups" have been immortalized as one of the finest light planes ever designed. A number of full scale "Buhl Pups" are being rebuilt by "old timers". This truly different design makes an exceptionally realistic and fine flying model.

Each year from all over North America the top Scale Model Builders come to the Nationals to fly in the exacting Flying Scale Event where models are judged for workmanship, authenticity and most of all flying performance! Against this keenest of competition Berkeley's Flying Scale designs have won 1st or 2nd in this event

at every Nationals for the last 18 years!

DUCTED-FANS

"½A" Gas Engine Powered

For "Monoline" or Free-Flight Flying

by Berkeley

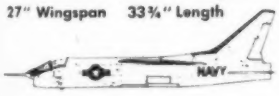
For "½A" Engines
Landing Gear Optional - Not included

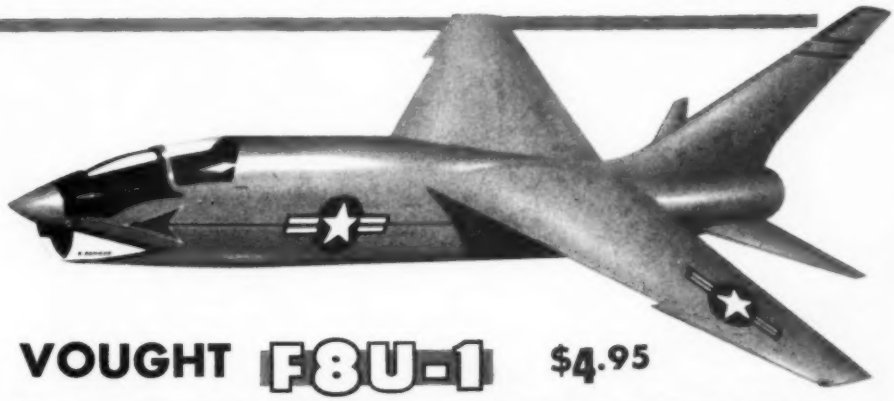
LOCKHEED "T-33A"

Best known of the jet trainers, the U.S. Navy "T-33A" is a fine design for ducted fan flying. With torque free propulsion, design is easy to trim, fine flyer.

¾" = 1' Scale 29" Wingspan **$4.95**

¾" 1' Scale . For "½A" Engines
27" Wingspan 33¾" Length





Powered by a Pratt & Whitney J-57-P4 with afterburner, its "Crusader" holds America's speed record of 1,015 m.p.h. & has made the fastest transcontinental flight to date. The first carrier aircraft to exceed 1000 m.p.h.

Full size plans with carefully organized construction procedure and sketches make this model easy to build Construction is lightweight for maximum ducted fan performance. Formed plastic parts simplify assembly.

Landing Gear Optional - Not included

VOUGHT F8U-1 $4.95
"CRUSADER"

Each Kit Contains:

- Authentic Multi-color Decals
- Full Size Berkeley Detailed Plans!
- Formed Celluloid Bubble Canopy
- Die-Cut Balsa and Plywood
- Formed Plastic Fuselage Parts
- Metal Propulsion Fan

DOUGLAS "SKYRAY" F4D-1

For .049 Engines 25" Wingspan ¾" Scale

$4.95

Landing Gear Optional - Not included

Five years experimentation by Berkeley, with ducted fan type models have helped make this dramatic new design a reality. Six ounces of static thrust make out-of-sight flights possible. Ideal for new "pull-starter" engines.

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A NEW DESIGN...

Designed for easy-rapid problem-free assembly, rounded edge planking is included to fit one against the other within fuselage curvatures without tappering or beveling. All wing & tail surfaces are sheet planked. No paper covering required.

100% NEW!

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- Authentic Full Color Decals
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1" Scale

GRUMMAN F-8-F "BEARCAT"

For .09 to .19 Engines — 26" Wingspan

Controline

featuring: **ROUNDED EDGE PLANKING STRIPS**

As in a ball-socket assembly, these new planking strips fit one within the other, following tight curvatures without bevelling. Makes planking fun.

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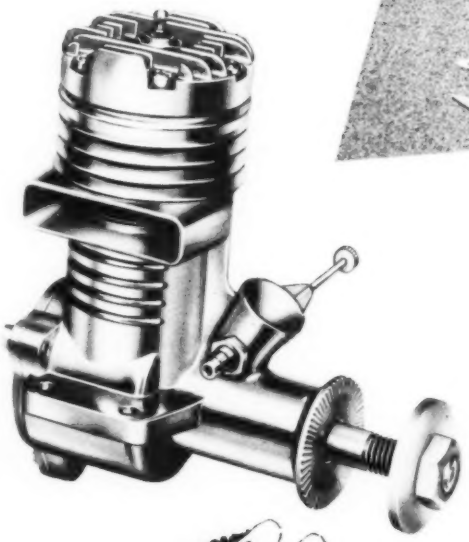
AIRPLANE DESIGN ENGINEER CHOOSES FOX MOTORS...

Photo courtesy Beech Aircraft Corporation



There's a lot of difference in piloting a B-24 in World War II and winning the 1957 Grand National Trophy with a model airplane; but James Z. Paysen knows power is essential in each case so he prefers Fox motors. Paysen is a design engineer for Beech Aircraft Corporation and you can expect much from him when it comes to flying. Paysen says:

"Fox motors have been my standby for reliable power the past ten years. Winning performance demands absolute reliability, at all times. A few of the things I have achieved when using Fox motors are:

a/ "Won numerous stunt and combat events in the midwest, using Fox motors.

b/ "Set a new class B speed record of 148.09 mph (now broken) with a Fox 29R and was runner up to Grand National Champion.

c/ "Won Grand National Champion using four different Fox motors." "Never worried about any of my Fox motors failing at a critical point and have never lost because I couldn't get my Fox started. I still have my first Fox 35; ten years old and still runs good."

After what Jim Paysen says, about all left to add is:

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Designers and Manufacturers of the World's Finest Model Airplane Motors

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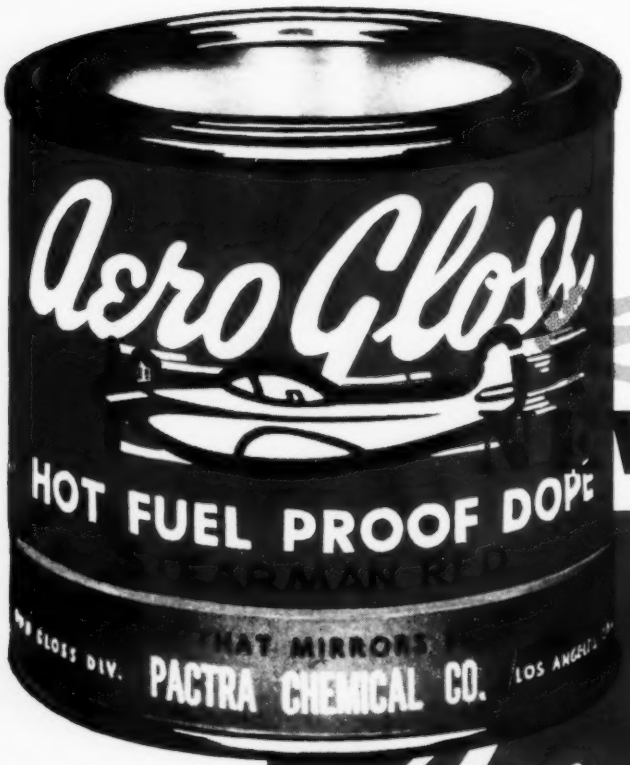

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